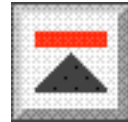


THE INTERNET INDUSTRY THE STATE OF THE ART



MODERATOR

Pat Lane

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SPEAKER

Joel Maloff

President, The Maloff Company

Pat Lane: Good morning, and welcome to Internet World. I'm Pat Lane, and I'm a senior program coordinator with Mecklermedia. I am here to introduce Joel Maloff, who will be talking to you about the Internet industry and the state of the art.

I would also like to mention that in the next session Joel Maloff will be replacing the speaker, so he will just continue on at 11:30.

Mr. Maloff is the founder of Maloff Company, which has dealt with the Internet. He has been a teacher, a consultant, worldwide consultant; as a matter of fact, he currently has his new book out, *Net.Profit*, sponsored by Mecklermedia and available through IDG Books.

Not to take away from any of his time, I am going to let him get started. Enjoy the session.

Joel Maloff: Good morning. Again, to echo what Pat said, we have had a cancellation in the second session this morning, which is "Leading The Internet: Who Are The Companies And Individuals That Drive The Emerging Industry?" What I will do is attempt to partly address some of the topics that were to be addressed by that speaker as we go through my comments this morning, and then just continue on so that we have more time. So, rather than take a break and stop as was planned at 11:15, I will just continue on so you'll have time for questions and for other information on that topic.

As Pat had mentioned, I do have a book that has just come out from *Internet World* and Mecklermedia, also published by IDG Books, that is available here at the show; and a lot of what I'll be talking about will be included in that.

I have been asked to talk this morning about the Internet and the state of the art as an industry. What I have chosen to do is to talk about this particular topic as to where are we today in the industry, how is it impacting businesses as end-users. I'm not going to be speaking to it from the standpoint of Internet access providers or Web out-sourcing or so forth, but looking at it from a user perspective — how does this impact you, what are some of the entrepreneurial opportunities, new jobs and so forth.

Now, to be topical and timely, since I'm talking about the state of the art, I thought it might be interesting to mention — I don't know if any of you saw *USA Today* this morning, but it seems that last week on Thursday a group of hackers known as "The Chaos Merchants" broke into Rodney Dangerfield's Web site and supplanted his opening screens with a picture of a naked woman. What it doesn't say is whether or not the naked woman looked like Rodney!

And what's interesting, moreover, is that the reason they found out that somebody had done this is that someone tried to download the picture, and had trouble and called in and complained about it. So as you can see, our industry is in a very interesting position.

Just to give you an overview of what I plan to cover this morning: I am going to talk a bit about organizational positioning using the Internet. What is it that companies are doing to position themselves to effectively take advantage of the Internet as a business tool, or suite of

business tools? We will also be talking about some of the cost-reduction opportunities, which I happen to believe are very important.

If you read the media today, if you look at the Internet, there are many people that believe that the Internet and WorldWide Web are synonymous. Clearly, they are not. One of the first areas that I as a consultant look at is how can organizations use this set of tools to be able to reduce expenses.

If you think about it, if you are able to reduce your corporate expenses by ten dollars, that ten dollars immediately goes to the bottom line. If you increase your sales by ten dollars and you have a margin of 10%, one dollar goes to the bottom line. From a corporate perspective I think it is important to look at all of the ways that these tools can and are being used by businesses.

We will look at marketing and sales, and clearly that's important. It's being done effectively in some cases today; we'll talk about what has worked and what hasn't.

We will also talk about internal communication. Again, this is another area that I think is often overlooked. Companies tend to think only externally — "How can I use the Internet to publicize myself?" — when in fact one of its greatest values and strengths may be in using it internally to better communicate with your own people, your own distributors, vendors, or otherwise.

And then lastly I will talk about what I refer to as "the entrepreneur's Valhalla." What are the new opportunities, the new businesses that are out there and emerging — or likely to emerge — over the next several years that will be able to incorporate and take advantage of the Internet?

Just a brief bit of background. As Pat mentioned, I have been involved with the Internet for quite a long time; I was Executive Director of the Big Ten University Research Network for three years, and I was Vice President of Sales and Marketing for a company called Advanced Network & Services, ANS, which was one of the largest Internet providers in the world for some time. I was Vice President of Sales and Marketing, and so I have been involved deeply in that area. Since January of 1994 I have been acting as an independent consultant and worked with organizations around the world to help them understand how they can reduce expense, increase revenue, or in some way tangibly contribute to the bottom-line mission of their organization.

I have worked with companies ranging from the Discovery Channel — we're very proud of the Web site that we have put up for them. I have worked with the National Football League, life insurance companies and companies throughout the world: Brazil, the Philippines, Australia, Germany. This is a worldwide phenomenon. I think it's very exciting. I think it's important to look at how it is being used and how it might be used.

I should also add that I will be taking questions, as appropriate, since we do have time. As we are going along, if there is something that you want to ask, please do. Raise your hand, shout out at me. I know this is a big audience. If you can wait until we get done with the prepared slides, that's fine as well. Anything you'd like to do, this is your session.

Now, one of the areas that I talk about in my book and in many of the other talks that I do is: Is the Internet a fad or a tidal wave? In my book, I say if you guess fad and you're wrong, you're going to drown. And to be honest, I think it's well beyond the fad stage. I want to briefly read to you some quotes from a *Wall Street Journal* article that appeared about three weeks ago. There is a company that is quite well-known, was very popular on Wall Street for a while, called General Magic that makes hand-held personal communicators. And in this particular article it says that like many other software and on-line services companies, General Magic has been blindsided by the explosive growth of the Internet and its graphical arm, the WorldWide Web.

I'm not sure I would characterize the Web as a graphical arm, but nevertheless the president of General Magic goes on to state that he had envisioned an electronic marketplace built piecemeal by AT&T and other telecommunications companies and accessed by hand-held communicators. But it's now becoming clear that the Web will probably be the main electronic marketplace and can be best accessed by personal computers.

The company goes on to say that "lots of companies were ambushed by the Net. I have a great affinity for the Internet, but only for the past year has it had any business visibility."

I think they're right at the bottom of that wave, waiting to get swamped. The fact of the matter is, the Internet is here to stay. What is critical for you as companies is to understand what it is, what it is not, and think of it again as a set of business tools that can be used to your advantage. Those companies that think it through carefully, that plan, evaluate, see where we are today and where we might be six months or twelve months from now, will be the ones that will succeed in the future that's coming. To ignore it and to say that it is a fad and just hype is to miss the opportunities that it represents today.

Now, from the standpoint of business use of the Internet, I think it is important for those of you that have seen the movie *Field of Dreams* to recognize that the Internet is not the "field of dreams." Unless you think it through very carefully, very thoroughly, understand what it is that it means to you, if you build it, they will not come. If they do come, they may not stay very long. And if they do come, they may not buy anything.

So it's important for you to understand what it is you want people to do when they see your cyberspace image that you create on the Net. We'll talk a bit about that this morning. It is not magic, and it does not work without a great deal of planning.

I have had people come to me and say, "We put up a WorldWide Web site and this Internet thing is terrible. Nobody came."

"Well, did you tell anybody you were there?"

"Well, no. It's the Internet. We didn't have to."

Wrong! It is the Internet, and it is just another set of business tools. How these tools are used, how well they are used or how poorly they are used, will impact you. We'll talk a bit about that further on this morning. And we are going to talk about what lessons have been learned thus far.

It is interesting; the Internet has been around for nearly thirty years, developed as part of the ARPANET project by the U.S. Defense Department. The WorldWide Web has been around less than four years, and Netscape, which is doing wonderful on the stock market, has been around less than two years. We are in a very, very new and evolving environment. What we take for granted today is new; we're just working out some of the kinks and some of the bugs.

What is important — and if I pass on any message to you today at all, it's this one — the Internet should not be technically driven. We should not be technology in search of application; rather, it ought to be driving the technology, [asking] "what do you want to do?" And then let's drive the vendors and Internet access providers and out-sourcing companies to deliver what you need, rather than what they think.

And that's true with security on the Net. It's true with front-ends and so forth. We'll be talking about that, but I believe the Internet should be a user-driven environment, and in fact it is becoming that. When I look at the Internet I try to look at what are businesses doing with Internet today. When I was at CICNet, I was trying to understand why our network traffic was growing at 20-30% per month, compounded. I asked our engineers, "what exactly is driving this traffic? What applications are occurring?" And their answers were: FTP, Telnet and e-mail.

I said, "You know, those aren't applications. Those are tools to do something." But what are we doing? I mean, are we sending recipes back and forth? Are we looking at naked pictures

of Rodney Dangerfield? What exactly are we doing? The answer was, "we have no idea, but isn't it great?!"

I don't think so. I think it's important for us to think of this again, not with all the mystique, not with all the buzzwords, but [as] tools. What do they do? And so I have been able to derive three distinct areas of business use over the past several years. The first is "rare remote" devices, and this includes everything that's too expensive to have everywhere you would like to have one: particle accelerators, space telescopes and supercomputers all fall in that category, but also medical imaging equipment, telemedicine, and remote imaging. In fact, during the Somalia relief effort, doctors in Washington, D.C. were actually looking at CAT scans of patients living in Somalia. That's remote telemedicine; it's actually being used all over the world. It does need high bandwidth, but it is using the Internet today. Even more mundane, from a business standpoint: distributed, computing remote client/server applications fall into that category. Your company is moving further and further away from big mainframes, its big iron. And so you've got client/servers distributed around the world.

How do you reach those servers that have the information that you require? One of the examples that I like to cite is a law firm that happens to be headquartered in Toronto, Canada, with a branch office in London, England. They will start working on a particularly difficult international law case first thing in the morning in London, work on it throughout the day, and at the end of the day they will place that information on a server, which is then accessed from their people in Toronto, where they continue to work on it for the remainder of the day. Their competitors are trying to figure out how these folks are working 18-hour days. Add an office in Sydney or in Hong Kong, and you can work 24-hour days. It is a new way of using your own corporate resources, distributing that information.

One other example of rare remote devices. Let's say that as a consultant you decide that you want my services; you want to sign my contract, but you're leaving the country tomorrow. I can't Federal Express it to you, it won't get there in time. You don't want me to fax it, that's not a good form for a legal document. You want the original, but I'm in Michigan, and you're somewhere else in the world.

If you give me permission, I have the ability to use the Internet to come across that network to your local area network and designate your laser printer as the output device, and print out my contract on your printer. You have it. You can do that today. That's rare remote devices, just one example of the kinds business uses.

The second area is information sources. We have gotten to the point with the Internet where we are absolutely overwhelmed with information. There's more than 14,000 network newsgroups, there are thousands and thousands of ListServers, Gopher servers, a hundred thousand Web servers out there. Not all of them are good, but there are that many.

How do you sort through all this? I think it is important. When you hear people throw out terms like the Internet is a marketplace of 40 million users worldwide, I don't agree with that. Sure, there may be 40 million people reachable in 172 countries on the Internet, but it is not a marketplace. That's like saying the world is a marketplace, or the U.S. or Brazil or Australia or Hong Kong is a marketplace. It's not true.

Instead, I believe that there are thousands of "micro-markets," or neighborhoods in cyberspace. And what is important is for us, as business people, is to identify the communities of interest, the neighborhoods that are of value to us. And we do that by using search tools to identify where these various resources are.

I'll talk a bit about some of those search tools in a few moments.

The last category is "intra/interorganizational communication." I used to refer to this as "interpersonal communication," and then it became clear that EDI, electronic data interchange, may not involve people at all; rather, it might be computers placing or receiving orders from

other computers, and so I refer to this as intra- or interorganizational. I think the intra- part is very much underplayed today. I mentioned that in my opening comments.

The Internet is a communications medium with a series of communications tools; how it can help you communicate internally is something that needs to be explored at great depth, along with how you communicate externally with customers, suppliers, sales personnel and service personnel, wherever they may be, anywhere in the world. It's important to understand where the value may be, and we'll talk about that as we go forward.

When you look to position yourself on the Internet, it is important to recognize that in cyberspace, image is everything. There is an absolutely wonderful cartoon that was around several years ago of two dogs, one sitting in front of a computer terminal, the other on the floor, and the caption is "On the Internet, no one knows you're a dog."

They also don't know if you are big or small, or where you're located. You could be located anywhere in the world. The beauty of it is that when you enter cyberspace you have left Boston, you have left Massachusetts, you have left the United States, and you are in an entirely new world. You need to understand the customs, the practices, how things work in this new world, because when you put your information up on cyberspace people anywhere in the world can see that information. They can see who you are.

When you send messages to people using even simple e-mail over the Internet, it is important to remember you should never, ever write something that you wouldn't want to live forever or be seen by your mother, because it will be seen all over.

I have learned the hard way that when you respond to a note from someone — I had somebody send me a note one time saying, "you know, I really think this person is a turkey." I sent the note back saying, "yeah, I agree, but they're really not that bad." What I didn't realize is that I had copied it to the person that was being criticized. I have a feeling some of you have experienced that as well. The point is, it's important to recognize what you're saying and where it can be seen.

I also have, as an aside, a bias that if you've ever seen notes posted from people who have an "xyz".com Internet address, they will have a disclaimer at the bottom saying my views do not necessarily represent those of my employer — and yet they're using that employer's e-mail service to make those comments. As a consultant, I tell my clients that I think they do represent you. If they're using an IBM or a General Motors or an AT&T e-mail address, and they're saying something and it's critical and not something you would want them to say, they are using company resources. That's just an aside; I think it is important that as you, as companies, start to use the Net more and more. You make sure your employees understand that these are corporate resources, and if they want to make comments that are inflammatory or otherwise, let them do it on their own, but not using company resources. It does reflect on you. Image is everything in cyberspace; you are what you appear to be.

I like to use the analogy that when you create an image in the Internet, it is very much as if it were a physical trade show exhibit. You can be using it to simply create an image so that people think well of you; you can be doing it to generate leads for future business, for future sales; or you can be doing it to actually close business right there on the spot — impulse buying.

It is critical that you think through in advance which of those you are trying to accomplish. I saw an interesting statistic not long ago that said that 20% of WorldWide Web sites were expected to be profitable by the end of this year. Well, what does that mean? How many of them want to be? How many of them are there just for image alone? And how many of them don't really know why they're there, other than we have to be on the Web?

So it is important to think through what are you trying to accomplish, what message are you sending. Are you in fact simply there for image? NorTel, formerly Northern Telecom, has a wonderful site that has a great deal of environmental information on it. It is very, very good. It

seems that the Northern Telecom people were required by the Canadian government to do a great deal of work on the environment. They have all this wonderful documentation and said, "What do we want to do with it?" Somebody said "Oh, let's put it on the Web." So they did, and they now receive all kinds of awards from schools and governments about all this great work that they've done.

Well, they didn't really do it for benevolent purposes, but they had it and they used it. Are they trying to sell you PBXs or central office switches using that? No. Are they creating an enhanced image? Absolutely! So that will be one that is not a profitable site; but is it benefiting them? Absolutely. It is important to think through what it is you want to accomplish.

As I look at most of the Web sites that are out there, it is apparent to me that insufficient planning and thought has gone into many of them. You will see in many cases what appears to be an electronic billboard; they have copied a brochure and put it up. It fails to consider the marketplace. It fails to consider the capabilities of the technology.

As you are creating a site, remember whatever you do is going to go into creating that image that will perpetuate your company, your organization.

I guess it was March of this year that CNP Publications, the people that publish *Interactive Age*, *Communications Week* and several others, went out and surveyed the WorldWide Web sites. There were thirty thousand Web sites they could find, of which they estimated ten thousand were business sites. They then went through those and picked their top one hundred Web sites in the world at that time — of course, it's many more now — based on how well those sites used the technology. That is up on the Net, and you can find it under tech.web. It's very interesting. There are hot-links to all of the sites, and those sites include some very big names, names like Netscape and IBM and AT&T, and some very small names, like The Maloff Company. It feels very strange for me, as a one-person company, to be on the same list with these huge companies with all these letters in their name.

The fact of the matter is, again, on the Internet no one knows you're a dog. They don't know that I'm a one-person company; I look the same as an AT&T. I think it's a riot, having worked for AT&T in the past.

But it is something that you can take advantage of as an organization. Remember, the image that you create is a lasting one. People don't generally come back to a site that they don't like, so you've got one chance to do it well. Think it through. Consider it as part of your overall marketing plan.

Now, I think it is important, too, that as businesses today are getting started they need to consider what expectations they have. What are they trying to accomplish? How many hits are you expecting on your site? Who are you expecting to come in? What are you expecting them to do when they get there? Who are you targeting? Where are they located? Are they domestic only? Are they international? In what countries? Why are they coming to you? Again, are they coming to you to gather information, image? Are they coming because you want to be able to use them as future leads? Are they coming to actually buy something from you? What are you trying to accomplish? Who is it that you are targeting?

What language are they speaking? You know, it is interesting. A year and a half ago I was asked what the de facto language is on the Internet, and it was English at that time. More and more sites are now moving towards other languages or choice of languages. In fact, there is a protocol being developed called "unit code" that would allow you to be able to access a site in whatever language you wish. I think it is important to recognize that even in this country — and I know there are many of you that are international — but even in the United States there are many people who are not native English speakers.

If you are using this as a positioning and sales tool, why not make it available to people in the language that is most comfortable to them, that will most accomplish your objectives,

whatever they are? Again, remember that you're in cyberspace. You're not in one location, you're reachable from anywhere. What is the objective with which you started out to begin with?

Lastly, test the waters. I think it is critical before an organization launches into an expensive program of any type that you have an idea of what you believe the benefits will be. I know, contrary to some views, I believe that the Internet is cost-justifiable. I do talk about that in my book. I have a template that I have devised to help people understand what are the business issues we are addressing; and by the way, a business issue to me is, "I want to reduce my inventory costs by 15%. I want to reduce my fax costs or long-distance costs by 20%." Those are business issues.

"We gotta be on the Web," ain't a business issue. You have to understand what you are trying to accomplish. Then you would have the ability to go in to your financial or executive people and say, "Here is what we believe we're going to impact. Here is what we believe the investment is likely to be, and here is the bottom-line benefit-to-cost ratio." It's a guess; it is not going to be perfect. But at least it demonstrates that you're thinking in terms of business issues, business relationships, rather than just thinking in terms of technology.

It is important to try it out. Test it out. See if it works. One of my clients is a very large insurance company. They wanted to create an Internet e-mail line very much like an 800 number where anyone interested in anything could call in. They wanted to have info at insurancecompany.com. I said, "You know, before you do that you might want to test the pipes and see what kind of response rate you're going to get, because you could have people calling on just about anything — policies that they want to claim, new policies that they want to buy, recruiting. Could be new sales agents. You could have any kind of calls. How are you going to handle the volume that will come in?"

And we didn't have any idea what that volume would be, so what we did as a test was to set up for their sales agent recruitment program at info-recruit@insurancecompany.com. All they did was add that e-mail address to the bottom of full page ads in *USA Today*, *Wall Street Journal*, and the *New York Times*. That was it. Didn't say anything more. 20% of all of the responses that they received in that initial campaign came in on the e-mail line. Now they have to figure out, what do I do with them? Who do I forward them to? They don't even have a coherent e-mail system throughout the whole corporation, so they were able to test the pipes, see where they were broken, and know where they fixed them without hurting themselves terribly.

It is important to test the waters, test the pipes before you roll out a plan completely. The beauty of the Internet is that it is interactive. You will find out very quickly what works and what doesn't work. Give yourself the space to be able to fix those pieces that may need correcting.

When we talk about cost reduction opportunities, one of my favorite is the fax. There is a Gallup poll that has been done for the past several years that indicates that the average large company spends 40% of its long-distance bill per year on fax. What exactly are we faxing? Where are they going? If you think about it, normally what we're doing is creating a document on a word processor, printing it out, handing it to someone who then puts it on a scanner — we call that a fax machine — and they then send it across a pair of wires, normally a dial-up telephone line, to a distant printer. We call that a fax machine as well, where we print it out again and either re-key the information or scan it one more time.

Why not just send it as an attached file? Why not just send the text, if you need to simply do that? You can. And I'm not asserting that you will reduce all faxes — you will not. But if you can cut your fax bill in half, that's 20% of your annual long-distance bill. You have the ability to start looking at tangible impacts.

Same thing with courier services. Why are we sending Federal Express packs or DHL or UPS all over the place? When I did my presentations around the world, I was doing a presentation in Brazil. I sent my PowerPoint slides as an attached file on an e-mail message. It got there within an hour; if I send it overnight it gets there in five days, and costs me fifty bucks. The fact of the matter is they have a usable file; they can translate it if they wish. They can print it out, whatever they need. It is much more effective.

Again, this will not eliminate all courier packs. However, I can tell you that when I was with ANS we had seven branch offices, and we sent out an overnight package to each of those branch offices every Tuesday and every Thursday whether we needed to or not. Why? It's because we had just always done it that way.

Think about how you're doing business. Think about ways that communications can help you be able to reduce those expenses. Long-distance voice costs. You know, it's interesting... When you call someone up to confirm a meeting, to confirm receipt of something, to ask a question, we are social animals. We can't simply call someone up and say, "Did you get my document? Thank you very much," click. We have to ask them how they're doing. We chat a little bit, and it builds up. On the Internet you don't need to do that; you can simply say, "Just checking to see if you got my note."

"Yes, I did."

"Thank you very much. See you for breakfast on Tuesday."

It works. You can actually reduce voice costs by the way that you communicate. I am a one-person company. I travel all over the world. If you really want to reach me, you send me mail at joelmaloff.com. If you call me at my office you'll speak to my voicemail, and what I'll tell you is to send me e-mail. That's the best way to get me.

Again, people are traveling a great deal. It is a way that works very effectively. Point-to-point leased lines are very expensive. Most of the large corporations have these. I'm not going to spend a lot of time on this, but companies are increasingly finding out that they can use Internet in a closed-user group or virtual private data network to communicate between their own branches, customers and suppliers as securely as if they were on their own private network.

It works. And it helps you not only to be able to extend the reach of your network more cost-effectively, because you can get the marginal sites, but also to potentially reduce costs from your network today. It doesn't work in all cases, but it is worth exploring.

The Trane Air-Conditioning Company is one I have worked with; they have replaced a 200-node SNA private network with an Internet solution, using closed-user group capability. You can quickly figure out that 200 nodes on a private line network is very expensive. They believe they have saved 25% on their annual communications costs by doing this. That's significant. I don't care how big you are, that's significant.

Personnel. You may be able to take advantage of having personnel in one office doing the tasks that had been distributed in the past, so again, you have the ability to explore how you can do more with less. This is the bad news. In fact, it was interesting; I was in the Philippines and a reporter there asked me a very unusual question. He said, "I want you to tell me, if you were a doctor and I was dying of cancer, I would want you to tell me the truth. What jobs is the Internet going to do away with?"

I said, "Well, I've never quite had it put to me that way. Perhaps there are some clerical jobs that will be impacted." However, as you will see towards the end of my presentation, I believe there are many more jobs that are being created than are being done away with, "cyber-entrepreneurs" and so forth. We'll talk about some of these when we get to the end. But, again, I think you have the ability to do more with less, and see how it can be of value to you.

Last is printed materials. I mentioned reducing inventory as a possible application that has been used by many clients that I have worked with. There are companies that are doing what is called “one-off printing;” instead of printing 15,000 copies of a brochure, knowing that some percentage of them are going to go obsolete before I can use them — and that some percentage of them are going to be damaged in shipping, or trashed so I’m never going to get to use all 15,000, and I’ve got to find a place to keep them — I have the ability to send the file of my brochures, my materials, to a printer and tell them, “I’m going to be at Internet World, deliver a thousand copies of that brochure to me at my hotel.” No inventory. I don’t have to worry about lugging them. They are timely; I can customize them for each show. It works. Printers are now increasingly doing this.

Now let’s say I want to do a show in Canada. Canada happens to quarantine printed materials coming in. My printer just simply transfers that file to a Canadian printer; the Canadian printer prints them out and delivers them to me in my Canadian hotel. Everything is great, I get them on time, and the Customs agents don’t even know what happened.

M: They do now!

Joel Maloff: It works very well. Yes?

M: Other comments about point-to-point leased lines?

Joel Maloff: Well, point-to-point leased lines are normally used in a private network environment. I believe that using the Internet can reduce the requirement for those, but not in all cases. For example, if they are being used heavily for voice communications between sites, the Internet is not a good replacement for that today. One could argue that it may be in the future, but I don’t think it is right now. I’m not sure what else you’re looking for on that point.

M: Fine.

Joel Maloff: Okay. Yes?

M: You wanted people to speak up...

Joel Maloff: Sure.

M: On your point there, exactly what we could call “Customs agent interference counter-measures?” I actually sent, like you said, courier service to Brazil; I couldn’t make it to the convention. I sent my materials to be presented, and they promised one-day service. The convention was in two days. It was held in Customs for about two weeks, totally missed the whole thing, and it could have been e-mailed or Interneted, and that would have solved it.

Joel Maloff: Yes. This gentleman’s comment is concurring with the comment about doing more internationally, that it does work; that you do have the ability to get information in a much more timely fashion that is usable.

You know, I don’t have it on these slides, but one of the other ones that I happen to like to use a lot as an example is sending out press releases. I send out all of my press releases electronically. I send them to newspapers, publishers and so forth around the world. The advantage is that when I do so, firstly they normally must read it. If I send them a paper press release, it sits in a stack of paper. Maybe they get to it, maybe they don’t. And also when they

do get it, it is electronically encoded, which means they can cut the information into their story and use it right away. They don't have to re-key anything.

The advantage of that is they spell my name right, and they get my e-mail address correct. It works. Yes?

W: I'm a little confused what you're saying about — and I'm very interested in it — getting something from your desk to a place that you're going to be giving a presentation X number of miles away. Are you saying that what you have set up at the hotel is a printer, and the hotel provides the opportunity for you to run off X number of things that you need to have run off?

Joel Maloff: No. The question is about my example and being able to do printing remotely. No, what I do is have a file of my brochure or a copy of my PowerPoint slides. I send that information either as an attached message on an e-mail message or using file transfer protocol. I actually transfer it to someone else's machine; they then have the ability at a printing press or a colleague's location to print that out.

So, no, I am not actually sending it to the hotel. Once they have printed out the materials — let's say we use the example of Canada — my printer has transferred the information to a Canadian printer, who prints out a thousand brochures and delivers me a box of them at my hotel so that I can then use them in this show. But they are not being printed on a printer at the hotel.

W: So you send them to the copy place?

Joel Maloff: Yes. I send them to a production facility in the destination or location I am going to be. The advantage is we miss Customs, I don't have to carry them, and they can be more timely because I can customize it to each show. I can say, "Welcome to Internet World Boston, come see me at Booth 334" on that brochure, otherwise you normally would print out ten thousand copies for economies of scale. I don't have to do that any longer because they're not doing typesetting as such; they are printing directly from the file that I have provided.

W: Just a follow-up question. Do you ever get nervous thinking that what if your file gets lost by the place up in wherever? I mean, there's some security in having the boxes done.

Joel Maloff: Sure. The question is, do I ever get nervous that they're going to lose my file? And the answer is, "No," because I don't send it the day before, really. I will send it several days before, and I will confirm via telephone or e-mail that it's been received. And they're local, so if I am sending the file to a Canadian printer in Toronto and I get to my hotel and they're not there, I go down the street and say "Where are my brochures? Print them off for me."

So no, I've never had a problem with sending information and having it get lost. Have I had a problem with files getting lost? Occasionally, but that is a rare occurrence. And, again, you can correct that very quickly.

All right, let me move on. Again, if you have more questions, I'm happy to take them.

Another area that we need to look at a little bit is how companies are using this for marketing and sales. And I am not going to read this slide to you, but I want to emphasize the point that marketing and sales are not the same thing; they are used in the same breath on occasion. But to me, marketing is the act of gathering information, finding out who your competitors are, who your customers are, who wants to buy your product, what they're interested in. Sales is the act of getting someone to say yes: "Yes, I will buy your product. Yes, I will subscribe to your service."

Now, in terms of marketing there are a variety of activities that occur. Gathering of information is the first; and the Internet is overwhelming with information. You have the ability to gather information on your competitors. Who are they? Where are they located? What are they doing?

As an example, I mentioned one of my insurance company clients. They wanted to know what their competitors were doing; I did a search and found several of them. One of them was one of their major competitors. We looked at their WorldWide Web site and it turned out that there were five bullets on the Web site. The first was nothing more than an electronic bulletin board; they had scanned in a brochure and that was it. It was boring. You look at it one time and it's done. The other four bullets were all very interesting, but next to each one was the word "future." We call that "vaporware."

Guess what my client now knows that their competitor is planning? And guess what we'll do better?

It is important to use the tools to identify what your competitors are doing, how they are positioning themselves. It is also important... I have one client that happens to be in a very controversial industry. They are a tobacco manufacturer. And doing a search on the Net, we found a large amount of information that was negative about their business. They may not like to hear about it, but they certainly need to know what people are saying.

Now, it is interesting; for that same client, doing the search for their competitors, we did find one of their competitors, and they happened to be listed in an on-line career center for job postings. We went and looked at the site for that company and it said "none available." That's not exactly the image that you really want to post. You want to have something that is of value and of interest, and you need to think about that up front.

Targeting customers. I mentioned the neighborhoods in cyberspace; how do you identify where your target customers are? Who should they be? I have often had clients ask me, "Well, how do we know who to target?" And I ask them, "Who do you target today? What is a description of the average buyer of your service?" Let's use those as keywords, do searches on the Net and find the neighborhoods, the newsgroups, the ListServes, the Web sites that they frequent, and let's observe those. Then let's announce that you are there.

You know, it is interesting... You're too large a group, so I'm not going to do it here, but quite often I will ask people how many of you have an e-mail address of any kind. I will then ask people, "How many of you also have an e-mail address on your business card?" Half the hands go down. Then I ask how many of you have any kind of electronic access, e-mail, Web site or otherwise, on your brochures, your advertising, your collateral material — and in a group of this size maybe I'll have five hands left.

Why keep it a secret? Tell people you're there! Let them know! You need to incorporate this within your existing communications vehicles. Put it on your letterhead. Put it on your invoices.

I was taking a train from New Jersey into New York City and we stopped at a train station, and there was an ad for men's cologne; and down at the bottom was www.cologne.com. I said, "you know, we've really made it when I can see a Web address in a New York City subway station." But it's important. I watch the World Series and see www.toyota.com on TV now.

It's come a long way. And what is important is for you to invite people to come see you. It isn't magic. It is not the field of dreams; you need to tell them you're there and invite them in. This is a common mistake that many businesses have made so far.

Environmental constraints. The United Nations has something called its International Trade Point Program, whereby they have created initially fifty servers in developing countries around the world. If you want to do business in rural Brazil or in Zimbabwe, you can log in to

these servers, find information on customs, trade regulations, maybe even get a listing of freight forwarding agents, and have their e-mail addresses to contact them. You can also provide your information about your products and services that are available in these countries. You can use the Internet to understand environmental constraints. So it is a valuable tool in marketing yourself.

Identifying resources. You have the ability to identify people, machinery, information that are out there and are of value to you. I mentioned earlier that I worked with Trane Air-Conditioning. They asked me in one of the sessions I was in to do a search on chlorofluorocarbons and "R-I Is." I had no idea what an R-I I was. I came from AT&T; I thought I plugged my phone into one. Actually, that's an RJ-I I jack.

R-I I is a refrigerant. I did a search on the Net — this is actually three and a half years ago now — and I found 58 hits. One of them happened to be from an environmental newsgroup and it was a professor from London, England talking about exactly the problem they were concerned about. They subsequently met with that professor, talked to him, and hired him as a consultant to assist them. That's based on a very simple search.

You have the ability to identify resources in many forms that are of value to you; and the way that you do this is through search tools.

Our search tools are getting better and better every day. Two years ago nobody ever heard of *Yahoo*; now it's the darling. And it's good. There's another search tool that I found recently that I like, called All-in-I. I've got the URL up here for you. This is a listing of probably several dozen different search tools categorized under WorldWide Web. There are probably 20 different tools, and when these come up there is a search box next to each one, so if you are doing a multiple search — recognizing that no one search tool knows everything — it only knows what it has been told exists, so you need to use multiple search tools depending on what it is you are looking for. You can just simply use a tool like All-in-I and go down the line and continue to look for them.

There are also resources to look for people. As you probably know, we don't have a great "white pages" approach in the Internet. As a way of testing these things, I normally plug in my own name, since I know I'm out on the Net and I know I'm visible. About three weeks ago, when I first found All-in-I, using the people section I plugged in my name and found two other Maloffs I've never heard of, one in Canada, one in California. And their e-mail addresses were located right there, clickable on that spot. So I sent them both a note saying, "Who the heck are you? Are we related?" So it is an interesting tool. I like All-in-I.

There is also another one called InfoMagnet. InfoMagnet is the only search tool I know of that actually searches and manages ListServes for you. It is very good; it does keyword searches on ListServes. I believe the URL is www.clark.net for InfoMagnet. If you do a search for InfoMagnet on *Yahoo* or some of the other tools, you'll find it.

Again, all of these are good search tools. There will be more that will help you sort through all of the information that is out there. This is the state of the art in search as we know it right now.

I am not going to belabor the point. Once you have gathered information, you need to be able to analyze it. How can you bring together people, resources, consultants wherever they might be, to help you analyze and evaluate the information that's out there? Now, I have clients, by the way, that I have never met, never seen and never spoken to. As long as their check clears and they like my work, who cares? It's a new way of doing business. I, as a consultant, am out traveling. They will send information to me; I will evaluate it and make recommendations to them.

This is just another brief point on accessing expertise. Again, you have the ability to contact these people because their e-mail addresses are readily available. So far we have been

talking mostly about free information. There also is an enormous amount of fee-based information available, whether it is the Dialogs or CompuServes out there, or America Online. In fact, I have the ability, even though America Online only has dial-up service at this moment in the U.S., I have the ability to access my America Online account from anywhere in the world simply by dialing into a local provider — I did this in the Philippines — and indicating on my America Online software that I want to use TCP/IP. So you can use it from anywhere in the world.

Yes, I pay for AOL, yes, I pay for Dialog or for CompuServe or for Mead Data. But it is available, and there will be more and more services at .com financial services that you will pay for because you want to pay for the quality and convenience. It is not always going to be free. There will be free resources out there; there will be fee-paid as well. It's important for you to determine what it is you need and what you are willing to pay.

Lastly, in terms of marketing, you have the ability to use the Internet to probe and test new markets as a real-time focus group or soundboard. The cult TV program *X Files*, the writers and producers follow some of the newsgroups, so that you as people participating in these newsgroups are helping them write their new scripts.

The movie *Star Trek: Generations*, a year before that movie was released somebody stole the script and posted it on the Net. Trekkers were very unhappy that Captain Kirk was shot in the back and bled to death; it was not a very noble ending. They changed the ending based on that occurrence.

Think about how valuable this would be to you in your business, to be able to get immediate feedback, whether it is e-mail, Internet relay chat, real-time, non-real-time reactions from people immediately so that you know how to adjust and impact your programs to make them work. What's important when companies look at selling on the Internet is that it is nothing more than an extension of your existing sales/marketing and business plans. It is not a stand-alone; it doesn't work by itself. You need to incorporate it. But recognize that when you have identified these neighborhoods in cyberspace, you invite people to come see you. You don't, as Kantor & Siegel purport to, send out messages to 14,000 newsgroups unless you want to get flamed. It's not a pleasant experience.

So what you do is identify the neighborhoods that are important to you and invite people to come see you. Once they do, it is a user self-initiated section and you can do anything you want. You can post your catalog, you can post your prices, you can ask for the sale. It's done all the time. You simply need to understand the tools and how they work effectively in cyberspace.

Is selling permissible? Absolutely. People have been selling for thirty years. It's just a matter of knowing how to sell, how to make it work, and how to incorporate it as part of your overall plan.

What is successfully being sold on the Internet? Anything that can easily be digitized: software, books, magazines, music. There are some wonderful music sites out there. Windham Hill Records has a great site. The Rolling Stones. You can listen to 15-second clips of the songs and decide if you want to go out and buy the CDs. Wonderful sites out there!

I have research reports that I have sold on-line that work very well. I know of software companies — in fact Microsoft has now just authorized the selling of their software by distributors over the Net. Now, the problem is if you have a 14.4 modem to download, I guess Microsoft Word would probably take about four and a half hours; so it is a little difficult.

But the point is, it's going to happen. In addition, anything that can [be sold] better be sold due to interactivity: printing services we've talked about, other products. I happen to be a wine lover; there are some absolutely wonderful wine sites selling wine on the Net. There's a great Napa Valley virtual vineyard tour with a map of the Napa Valley; you can just drive up

with your mouse clicking on different sites. It's absolutely wonderful! But the wines are just a little bit too dry over the Net for me... But it is a great way to begin to sell product.

Legal services. There are many legal firms that have sites. West Publishing's Westlaw service is available over the Internet. Charles Schwab, Fidelity Investments, all have sites on the Net. And I tell people, "Let's see if we can find one that doesn't fit. Is there something that can't in some way benefit from this?" And up until about nine months ago I was saying, "Well, the one thing I really don't like over the Internet is voice." Now we have *InternetPhone* and a variety of other ways to do it. That's occurring as well.

Again, it all comes back to individuality, what works for your business. When you are looking to sell, there are a variety of ways. There are the direct ways, the Web site that says "Come buy from me." Then there are indirect methods: electronic newsletters, participating in discussion groups so that you are visible. But remember that when you have a Web site, the only thing that you know primarily about people that have visited your site is what computer system they came from. So if they happen to be from CompuServe or America Online you know they came from there, but you know nothing more about them. You don't know who they are, how old they are, what demographic information might apply.

If you are building a Web site, it is important for you, if this is what you're doing with it, to be able to capture that information. Know where they went within your site, so you need to ask them. More and more sites are asking you to register, sign in so we know who you are. Recognize what they're doing is gathering both demographic information and possible lead information on you.

If you are putting up a site, recognize that you need to know this information and design that in. What are the demographics? Who is it that you are contacting? Where did they come from in terms of the type of service? What capabilities do they have? All of these types of information need to be consciously gathered on your part.

When we talk about internal communication, again I think this is an area that has been missed thus far by businesses. How can you take advantage of using these tools? Locally distributing corporate news so that your employees know what's going on. You have a new product that will be announced and the first time they see it, it's not in *USA Today*. They know about it in advance; they understand it. Your sales force knows what's going on. If you have people that are remote, if you have promotions, if you have changes, it helps to reduce the "Foreign Legion" effect: "I'm sitting out here in Seattle or Boston, corporate headquarters is elsewhere, I never know what's going on." It helps feel as if you're more part of the organization, and that can be very important in terms of morale.

Also in terms of internal organization, the Internet can be a wonderful tool for groupware software. There are a variety of efforts that have already been underway with Lotus Notes. AT&T has a Notes network. I'm not sure how that's going to change now that IBM is involved, but there is an AT&T Notes network. CompuServe has a Notes network, and Notes can be used across the Internet. Not very well publicized, but in fact several months ago Netscape acquired a groupware company called Calabria. You can read between the lines and see what they're planning on doing. Netscape looks like it might be competitive with a Lotus Notes environment. They're ambitious.

But, again, from a corporate standpoint it is important to understand how these tools work to facilitate communications across internal corporate lines.

Let's shift gears for a second and talk about what are some of the entrepreneurial opportunities that are occurring. Well, first I want to mention one that I think is closing. If you are interested in becoming an Internet access provider, especially in North America, the window is about closed. It's a little bit late, and unless you are very specialized either in

geographic or vertical industry niches, the big guys are here. So I wouldn't look to open a new Internet access provider.

For other countries where they are not well-represented yet, this is going to continue to grow. Non-North American access providers probably will have an opportunity over the next twelve to eighteen months, but beyond that I think we are going to see virtually every major country very well-positioned and penetrated with access.

Now, another area that is very interesting is Internet training services. It is becoming saturated. And I'm sure that all of you are bombarded with fliers for new training programs. The problem, though, is that they tend to be very broad-spectrum in terms of quality. There are a lot of people that learned about the Internet six months ago and are now experts, so it's important to identify what you are looking for in terms of training. Is it hands-on? Is it technical? Is it business application? And be clear on the capabilities of the training organization that you are looking to use. But training services will be around. This is a tool, and people are going to need to be taught how to use it.

I have been asked in the past by reporters that call saying, "when a company hooks up to the Internet, don't they have to worry about employees wasting time Net surfing all day long?" My answer is, well, that's sort of like saying let's rip out all the phones because I might call my wife to see what's for dinner. This is a tool, just like the copying machine is a tool and a company car is a tool.

We need to tell people how we expect them to use these tools and what it is they can do with them. So there will be a need for corporate training internally for quite some time, in my mind. There will be opportunities for entrepreneurs to do this, positively.

Internet hosting services. This is Web out-sourcing, other kinds of hosting where you out-source your services to a company that will do it for you. I am currently working on some research to evaluate this, and a lot of the consulting that I have done for my clients has been in exactly this area. We're a company; we don't want to build the infrastructure, hire the people even if we could find them. We want to pay someone else to do this. There are hundreds of these worldwide; how do you sort through them? How do you determine which ones have which capability? And if you are looking to get into this business, how do you position yourself as being more credible, more reliable than others? This is an area that is going to continue to grow and become customized with different types of performance as we move on.

Internet security services. I believe that this is the true growth area for both large organizations and small organizations, both security software and physical security devices, authentication devices like "smart" cards, biometric scanners like optical scans, retinal scans, fingerprint, thumbprint, voiceprint. These are all now coming down in price and are going to be much more widely available over the next several years. Again, working in conjunction with software. There are many, many opportunities we are going to see here.

Then virtual business services. These include language translation services. I want to do a proposal for you; you happen to be in the Philippines or Hong Kong. I do not speak Tagalog; I do not speak Chinese. So what I want to be able to do is send you on the Net my Microsoft Word proposal; I want you then to interpret it so that all of the context is correct. I'm sure that I'm saying what I want to say; you send it back to me and I can then submit it in the native language.

This is happening today. There are vendors starting to put up storefronts, making themselves available on the Internet today to do this. I think it is very valuable. We're going to see a move to more and more customization of languages; again, a great entrepreneurial opportunity.

Internet search bureaus. There are companies out there that instead of you having to spend all day searching the All-in-1 or Yahoo or WebCrawler or Lycos, they'll do it for you. It's

the 90's version of a clipping service, I guess. The fact of the matter is there is an opportunity there.

In addition, within your own corporation I believe we are going to see the role of corporate librarian, corporate information specialist become more and more important. I, as an employee in the sales and marketing, legal, or financial departments, don't want to be a specialist in *Netscape* or *Yahoo* or otherwise; I want someone that can tell me how to do it. That's another internal opportunity.

"Cybertectives." That's a cute term for people using the Internet for surveillance. Well, we've heard about all the hackers that are doing it for fun; what about businesses that are now going to do it for profit? You want me to spy on your competitors? I can do it over the network today without ever leaving. What about bill collectors, people that are trying to find deadbeats that have skipped out? All of these are opportunities to use the Net in new ways today. Now, if you're the deadbeat, I apologize! Sorry I put this bug in somebody's mind. But if you are a private investigation firm, what about using the techniques that are out there?

There is one I thought was really interesting. In doing some searches for businesses, I found the "Cleaning Clique." It's a cleaning service; they happen to be specialized, I believe, here in Massachusetts. But they're a cleaning service; they make themselves available over the Internet.

What is the possibility for promoting yourselves using the Internet, to be able to capture market or using the Internet as part of your deliverable? There are thousands of them.; it is just a matter that you need to think through as to how it impacts you.

So what's coming in the next year? Well, firstly, I believe that we're going to see more big-name Internet service providers, Internet access providers, in addition to the big names that are already there — AT&T, America Online, CompuServe, Prodigy, MCI, IBM, Sprint, Microsoft, Pacific Tel, Ameritech, NYNEX, are all now in the Internet access business. Most of them weren't a year ago. In addition to that, I believe that we will see the other regional Bell operating companies, independent telcos, long-distance companies; cable and wireless is about to be a force in the Internet.

Will they be as big as the others? Hard to say. But they will be there. LCI International, formerly called Lytel, again, another long-distance, fiber-optic-based. Bell Atlantic, U.S. West, Bell South — all Bell regional operating companies — will be in the Internet access business in some way, shape or form.

What about TCI, the big cable company? I think it is very possible that we're going to see some of the large cable companies become very active. There are tests that have been going on for three years now; there are cable modems that are becoming more and more effective, so these companies are likely to get into it. Apple may very well move out of eWorld into much broader Internet capability.

And then at least one non-North American U.S. provider will occur. I believe that we are going to see large providers from Europe or Asia start to come the other way, and the reason is as follows: If I am a multinational corporation, I have branches not only here in the United States but in Europe and in Asia. I want to have a provider that I can go to and say, "give me Internet access, dial-up, leased line, whatever it may be, wherever my branches are located." Today I can't do that; there is no one provider that has most major locations in the world covered. That's changing, with the announcements by UUNet and PSI and others. But I believe that we should not ignore the fact that there are other major players internationally, and this is a global market. There are no borders when it comes to the Internet. There are when it comes to PT&Ts and licensing, and so that has to be considered; but we will see transition as this becomes more and more of a global environment.

By the way, I should add that just because I'm saying these vendors are going to be in the game doesn't mean they're going to do it well. And doesn't mean they will succeed. There will be a tremendous amount of positioning, merging, alliances that will occur; and I think that's the next major step to look at. For example, will NETCOM, PSI, or UUNet be acquired by someone? It is not out of the question. Some of those companies that I mentioned on the previous slide may very well believe that the quickest way for them to gain market leverage and penetration is to buy one of these providers. And when you look at the prices that some of these organizations have gone for thus far, it might be a good buy for some of them. Again, I think it is an area that needs to be considered. I am not predicting this; I am saying it is a possibility.

Will IBM absorb Prodigy? As you may know, IBM and Sears jointly own Prodigy. I think it is very possible that over the next twelve months that Prodigy will become the IBM information service, just as Advantis is now the IBM global network formerly owned by Sears partly as well. Again, there is some logic there. Do I know anything inside? No. But I do watch the trends.

Will Colorado Supernet or Digital Express or DataBank or The WELL or any of these other so-called second-tier, primarily Internet access providers, go public? When you look at what the IPOs have done thus far, boy, that's very tempting. So we may very well see some other companies going public over the next year or so.

Will one or more of the regional Bell operating companies acquire an Internet service provider, an ISP? Now, I think that is very likely. Again, I look at companies that are late in getting started, whether it is a U.S. West or a Bell South or a Bell Atlantic; the quickest way for them to be in the game is to buy an existing Internet access provider. Whether they are compatible and whether it will work is an entirely different issue. But will it be something that will occur? I think so.

Additionally, American Internet service providers are going to be spreading internationally. We have already seen major announcements from UUNet, from PSI, from AT&T that they are expanding their international presence. CompuServe as well. In fact, as of several months ago CompuServe's revenues, their customer base, was only 65% North American; the rest was worldwide, with 25% from the Pacific Rim. I think it is very clear that all of these companies see this as a global marketplace and are going to be pushing in that way.

However, having worked internationally quite a bit, I believe that these companies will find a bit of difficulty in doing so. They may be perceived as invaders if they come in on their own, whereas if they come in partnering with organizations they are likely to be much more effective. It is going to be a very wild and interesting access game during the next twelve months or so.

Lastly, I think that physical authentication devices like smart cards or biometric scanners will become the hot item over the next twelve months, where they will be used as part of a complete network security plan rather than just saying, "oh, we need security, let's stick in a firewall." They don't work by themselves; they need to work as part of an overall plan in conjunction with a variety of other tools. So I think this is a new, hot area that you're going to see more and more about over the year.

As part of my concluding talk, for the first comments and for those of you who came in, the second session that was planned has been canceled, so we're going to continue talking about that topic as soon as I'm done with these slides.

Learning how to do business on the Internet is absolutely critical and will be unavoidable during the next year. Simply to say, "Well, let's just throw something up and see what happens," could be very damaging to your organization. So it is important to learn how to do it, test it out, try it out and see what works.

And then, lastly, it is important to take advantage of an industry that is evolving at warp speed. But it is going to be difficult; it's better to grab on and hang on than to be left in space dock.

So let me stop there. Are there any questions that I can answer on the discussion that we have had thus far? Yes? All the way over in the corner.

M: Referring back to when you were talking about some of the ways to use the Internet, i.e. anything that is easily digitized and transmitted... Regarding, say, music services or something like that, what are your thoughts or what do you see regarding copyright of that information? You mentioned the Rolling Stones and these 15-second clips and whatnot. How is that going to be done?

Joel Maloff: The question is, "What are the copyright issues when you have the ability to download something off of the Net?"

Again, I am not a legal expert on copyright, but my understanding is that they are copyrighted; that it is by governing law of wherever that area is. It is the same concern today as somebody taping a videotape and sending it on. I don't think the medium makes that much difference. It does make it easier to do, and there are some enforcement programs in terms of software that have been attempted. Yes, sir?

M: I am in touch with Ted Nelson — who is sometimes credited as the founding father of HTML, Hypertext Markup Language — and he answered that question differently. I bring to your attention that he proposes trans-copyright as a way to copyright things on the Internet. He says currently today when you put it on the Internet, it's in the public domain.

Joel Maloff: That's correct.

M: They can use it however they want to. That means you can copy pictures, you can copy text, you change the literature, you republish, it's completely public domain. So that issue should be further investigated with legal expert advice currently on the state of the art, what is trans-copyright law and what is copyright law.

Joel Maloff: Just to summarize, the gentleman says that there is a need to investigate trans-copyright law and new case law which hasn't been established yet. And I agree with that.

Other questions? Yes, sir?

M: Do we have to wait for these big companies to provide us worldwide ISP access? If not, how do we take our two or three hundred mobile sales force with local call access to the Internet, to the Web, et cetera, in the near term?

Joel Maloff: The question is, do you need to wait for one company to offer service globally or can you use multiple companies? The answer is, clearly you can use multiple companies. What is important, what I always recommend for my consulting clients, is to put together a list of your requirements. What do you need from providers? I call it a request for proposals. Submit it to the providers in the areas where you are looking to go and make sure that they address the specific concerns that you have.

You can do some follow-up, ask for reference checks and so forth. You may have them using different front-ends, different software. But once they're on the Net, it's all one happy

family. So, no, it is being done today but it does require more work on your part than if you had one provider that covered everything.

Other questions? Yes? In the front.

W: How do you see the smart cards aiding in security? Will everybody have their own little card and have an input device on their PC?

Joel Maloff: The question is, how does the smart card aid in security? Smart cards help create a very physical and finite definition that you are who you say you are.

I think it is going to occur in a couple of ways. The first way, for private companies, is that they can issue their employees a smart card, and so when they go to log onto a server they must authenticate themselves using that smart card. That's for a private environment.

For a commercial environment, I see the possibility of subscription services. Let's say I am going to have a newsletter that you pay for. As a startup fee, I charge you a \$100 startup fee, which includes a smart card — smart cards are about \$50 a unit right now — so that everybody that wants to get into my site then has to put in that code or run that card through a reader or whatever it might be. Those are the two methods that I see being used right now.

Other questions? In the middle.

W: Do you see maybe a smart cards will work, or do you see that everybody logging into everybody else's service, where there'll be a standard so I can log into a hundred different services and I don't have to put in my own unique ID and my own password? And also, do you think the security is there to be able to transfer personal information yet? Or is that coming? What do you think about that?

Joel Maloff: The question is, what about the possibility of having a smart card as an example that can be used in multiple sites rather than one site. And the danger there, of course, is the more you proliferate it the less secure it becomes. So yes, it is possible, but I'm not sure how I recommend that yet. It would depend on each individual situation.

The second question was, is the security there to transfer confidential information today? Using one of the smart cards that I am aware of, the ABN, Amro Bank in the Netherlands, permits you to transfer funds from one account to another, and that's pretty personal and that's being done right now. I happen to believe that, in terms of security, the Internet can be made acceptably secure if you understand what acceptable means to you. That means doing detailed research, developing a plan, understanding who you are protecting it from, why you are protecting it, how much it's worth to you. With all of that, you can put together an acceptable system.

Nothing is impregnable, so you need to understand what the acceptable level of risk is for you. But, yes, it can and is being done today. The ones you hear about people getting hacked into were for the most part ineffectively secured. Like Rodney Dangerfield's site. Yes?

M: What do you see as far as pricing goes for provider access? And also, as the big players like AT&T, MCI and all the other guys come in, do you see interaction from public utility commissions on establishing fixed pricing or something like that across the board? Essentially, what we see now as pricing has been factored into the future. Is it base cost, or is it going to go up?

Joel Maloff: The question is, how will pricing change, especially with large companies like AT&T and the RBOCs and IBM getting in.

I believe that pricing is going to come down a little bit from where it is today. We have seen pricing come down 30-40% over the past several years each year. But I believe it is getting pretty close to the stable level of where it should be.

You will continue to see multiple models. For example, you will see some pricing that is totally usage-sensitive on dial-up services - X number of dollars per hour, no flat fee. You will see some that are totally flat rate. And then you will see a variety of models where they're a combination: a flat fee with a usage fee for so many hours afterwards; or for leased lines services, what I refer to as a "stair-step." For the first layer, if you use it X number of hours or amount of time, it costs you this; but we're going to monitor it and if your usage starts to go up, then we bump you up to the next level. It is predictable and budgetable.

In terms of projecting costs out over the next several years, I think you can safely use the numbers that we're at today. It likely will be lower but probably not a lot lower, maybe in the 15-20% range.

M: And, again, do you see government intervention?

Joel Maloff: In terms of government intervention, most likely where that will occur is on the local level. And I hope it doesn't occur. The thing that concerns me, when you get into regulation, is that you start to minimize the ability of smaller entrepreneurial firms to compete because they don't have the ability to do the rate filings and tariff filings that the larger ones do. And it would be an artificial way of constraining a very robust environment that we have today.

I think before regulations like that occur, it needs to be examined very carefully, and I hope it is. Right now the market seems to be acting as a very good cover.

Other questions? Yes, sir?

M: Since there is no concept of quality of service guarantees, do you visualize an ultimate physical infrastructure which is tightly controlled by either telecommunication companies or big businesses, and the rest left to hackers and lot of personal communications?

Joel Maloff: The question is — let me see if I get this right — you're suggesting that the Internet may become the realm of only the large companies, and the rest left for hackers and smaller people? Was that your comment?

M: Yes. The way I see it, there are physical infrastructure alternates.

Joel Maloff: The Internet access companies today all buy capacity from the physical fiber-optic-based providers. But today the Internet as a marketplace is still specialized and relatively small, and I think it is going to be a long time before the large companies put out of business the Digex or NetXpress or other companies. Again, they are much more agile and this is a very rapidly moving environment, so, no, I don't see them being put out of business by the large ones.

Everybody thought that when Microsoft announced Microsoft Network that they would dominate the Internet and put everybody away. Not a chance! Don't think that's going to happen at all. Yes, sir?

M: Do you see information providers moving to off-line type communication as opposed to on-line because of on-line traffic on the Internet?

Joel Maloff: The question is, will on-line information users move to off-line services because of traffic? Actually there will be some of that. I believe we are going to see more and more CD-ROM technologies that have hooks into the Internet whereby it has the information. It might be large file size. I am looking at that information, but I want something that is current, like what has happened in the past month. I click on an icon; it links me into a Web site that is on the Net, seamlessly. So I think we are going to see on-line/off-line media connecting into each other. Yes, sir?

M: What kind of pricing formula do you see evolving this year in charges of flat subscription fees or hourly usage rates or fee for service, pay per hit?

Joel Maloff: The question is, what kind of pricing schemes will occur in terms of hourly, flat rate, or pay per hit?

I don't think we're going to see pay per hit in the next year. The problem is you have to determine what is a hit, and then the amounts are likely to be so small, you're not going to bill somebody a penny on a MasterCard, so I don't see that coming about. Again, I see continued evolution for access from where we are today that's either fifteen, twenty dollars a month for X number of hours and a per-hour rate on top of that for dial-up. For leased line access they will continue to come down, mostly being based on a flat rate; but as usage starts to go up, I think we are going to see some of that stair-step method.

And for the on-line services that charge a fee, each of them will come up with their own method. Some will be a subscription service: I charge you ten bucks a month and you can get in all-you-can-eat, but you have to have an authorization code, a smart card or otherwise to get in.

So that's likely to occur. Again, it is an entrepreneur's dream. Any and all methods are going to be tried, and the ones that succeed are the ones that are going to last.

Other questions? Yes? All the way in the back.

M: Do you see any long distance carriers changing their pricing mechanisms to the ISPs to packet-based pricing?

Joel Maloff: That's an interesting question. Are any of the long distance providers changing their pricing mechanisms to a more Internet-like packet-based environment?

I haven't seen any signs of that yet. But I know that both local exchange and long-distance providers are now very concerned about what impact the Internet will have, especially when you start seeing a lot of people talking about *InternetPhone*. I don't think it's going to yet put NYNEX out of business, but they're all concerned about it, and there may be new models for pricing their existing services. I just don't know anything specific about it right now.

Other questions?

Okay. The other topic we were going to talk about — and we're just about out of time anyway — was, "What are some of the companies and individuals that are driving Internet?"

There have been a variety of companies out there that I consider to be key drivers. Clearly, if you look at Netscape, Netscape has come from absolutely nowhere to be a key player in the Internet environment. But of all of the access players right now that I think are in the driver's seat, CompuServe to me is arguably the largest Internet access provider in the world. They have a huge customer base; they are transitioning them to Internet access and they are positioned well internationally. They will be very much a key player.

The Internet is also a community of personalities. There are many different people that are out there that are driving it, from the founders of UUNet or PSI, the key people within

Netscape and so forth; so we are going to see a very dynamic, evolving environment. It is important to watch out for these providers. It is also important to look, as I said earlier, at the new job opportunities that are out there. What new kinds of career opportunities are presenting themselves?

I wasn't really prepared to address that topic in any detail, so if any of you have any questions on that, I can take those as well. Are there any questions on that particular topic?

Well, you have been a very patient and quiet audience. We have gone over quite a bit on the time that we were allocated, and I am going to end it here. I will be up here for a few more minutes if you need to speak with me; otherwise thank you very much. You've been an attentive audience.

THE INTERNET INDUSTRY THE INTERNET IN 2010: AN INDUSTRY LEADER PANEL FORECAST



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John Patrick
Vice President, Internet Applications, IBM

Mark Lonergan: Good afternoon. Wow! What a crowd! Alan Meckler was describing the first of these conferences back in 1991, and according to him there were fewer people at that conference than are represented in this room today. Congratulations for finding your way here and, by extension, to this particular meeting.

Welcome to the “Leaders of the Internet” forum, and our study of the future of the Internet going to the year 2010. At this largely technical conference, our mission is to divert attention away from the technologies which will shape the Internet, and be much more focused on the real impact that the Internet will have on us as people at the cultural, social and political level.

Our goal at this roundtable is to stake out the big picture, to set our camera on a wide lens and to look at the basic fundamental issues that will shape our industry, and by extension, that will shape our world. By understanding these strategic issues, we will stir debate and help form some of the tactical decisions that confront the people in this room here in 1995.

In other forums you will learn what technology improvements will transform the Internet as a computing and communications resource. Here we hope to create context and foundation for that technology, and to give you some glimpse of the impact that we as a group will have on the future of this planet.

To perform this feat of prognostication, I have invited four individuals who have each had an enormous impact on the Internet already. I will introduce each more fully in a moment, but please let me introduce the four people who make up our panel.

First, on my left is Marty Tenenbaum, CEO and founder of Enterprise Integration Technologies in Menlo Park. On his left is Steve Levy, the Chairman of Bolt, Beranek & Newman in nearby Cambridge, Massachusetts. Next to him is John Patrick, Vice President of Internet Applications at IBM and based in Armonk, New York — or Galactic Central. And on his left is David Garrison, the President and CEO of NETCOM Online Services in San Jose.

My name is Mark Lonergan; I’m a partner at the executive search firm of Heidrick & Struggles, and am a founder of our unique Internet practice. I am a fifteen-year telecommunications industry veteran, having spent ten of those years at TimeNet, a well-known Internet predecessor — and although any of you from MCI might debate that, the rest of us consider it a predecessor!

To make this discussion a little more dynamic, I asked each of our presenters today to spend a few minutes discussing the future from his own perspective, and I think you will find that their observations will create energy for the discussion that follows. After their comments

we'll go interactive by talking among ourselves about the issues that affect us in the Internet community, and at the end of that discussion we will ask for input in questions from the floor and encourage you to participate as an audience.

Now let's set the mood and let's talk about a few non-Internet events that I predict might happen in the next ten to fifteen years. Suddenly we're at October 30th in the year 2010; we're transported, as Rod Serling might have said, through time and space. The world has become dramatically altered, and few can envision the enormity of the changes ahead. Here is just one portent of that world to come.

With improvements in superconducting materials and conduit, electrical generating facilities in North America have been dwindling in number in favor of much more massive, centralized facilities in Juarez, Mexico, and Akron, Ohio. The last remaining fossil fuel plant in the United States was decommissioned in March of last year, near Pasadena, Texas.

An earthquake measuring 8.4 struck off the central coast of California near Santa Barbara last September, causing the loss of 9,700 lives and over \$185 billion in damages. Highway 1 is not scheduled to reopen in sections for another ten months.

On the sports front, and perhaps on the whimsical front, Northwestern is looking to set a record and become the first "three-peat" Rose Bowl champion — I said three-peat Rose Bowl champion — despite the loss of twenty-two players and fifteen freshmen to the NFL in this year's draft. Parenthetically, none of the panelists have been able to guess yet where I went to school!

Greater China has finally surpassed the United States both in software revenues and in the number of Kentucky Fried Chicken outlet locations. Microsoft has more development engineers today in Canton Province than in the entire state of Washington. That's a scary thought.

Boutros-Boutros Ghali finally stepped down at the United Nations under a great deal of pressure, no longer able to explain the U.N.'s inconsistent military policy. His post went to the relatively obscure foreign minister from Georgia in a close vote of the General Assembly.

I'm an executive search guy, not a speechwriter.

Finally, on the medical front, four years ago scientists created the means to inexpensively join egg and sperm in the laboratory, determining the sex of the child and maybe other small genetic improvements. This advance alone leads to the births of over 18 million boy babies in India and only 3.1 girl babies in the year 2009. Bridal dowries disappear as part of a tradition in high-caste Indian families.

That's one man's view, my own, of some of the possibilities in the non-Internet, far-flung future. Our world will be shaped in the next fifteen years by both natural and man-made events; small direction shifts made today will yield astonishing improvements in the world of the year 2010. Nowhere is that more true than in the technology area and the industry that we now call the Internet. We are all affected by that, presenters and audience alike. We are at the jumping-off stage of a revolution, and some of the rebels who will lead that movement are sitting in front of you today.

Let's begin our review of the future. I would like to start this by introducing our first presenter today, John Patrick, whom you heard briefly introduced before. John, as I said already, is Vice President of Internet Applications for International Business Machines in Armonk. John has an EE degree, a BSEE from Lehigh University, and has both an M.B.A. and LL.D. degree as well. John was formerly, before his current post, Vice President of Marketing of what we now call the Personal Systems Division, and best known at IBM as the father of the ThinkPad from a marketing standpoint. John was also, earlier in his career at IBM, the Co-founder of IBM Credit, which has become one of the most successful efforts of its kind in technology. A 28-year IBM veteran, I am pleased to introduce John Patrick.

John Patrick: Thank you very much. (I am actually quite knowledgeable about the ThinkPad, but they insisted we use this unusual program called PowerPoint, and I must confess I'm not quite used to it. Okay, I guess it's going to work. See if I can bring up some video here...)

Well, good afternoon. It's really hard to speculate about what's going to happen in the year 2010. My friend Alan Meckler and I will each be starting our 44th year with IBM and Mecklermedia — or perhaps we'll be on the beach, enjoying the great job that our teenagers are doing as CEOs of high-tech companies who are totally Internet-oriented.

I would like to talk with you just for a few minutes about where I think we've been, where we are, and where we're headed as businesses, as a society or as individuals. Certainly we have seen a tremendous increase in interest and excitement about this thing called the Internet, from a curiosity to a media darling, from a grass-roots set of activities in my company — and perhaps yours and many others — to something that is discussed in the boardroom. Over at our company I have been talking about something called “get connected” for the past eighteen months. Perhaps some of you heard me talk about it at the keynote in San Jose in April; I talked about a set of ideas that can enable a company or a country or an organization to transform itself because of the Internet, to open itself up and become accessible and approachable, and to use these six simple ideas — which I will not go into this afternoon — to engage in dialogue with the constituencies of your organization in ways not possible before.

If you missed that discussion or if you are interested in this area, feel free to visit my personal Home Page on the Web at the URL you see there, and feel free to take a white paper that's there and read about it.

I think where we are right now is in an educational mode, and people are learning that the Net is really mainstream IT. It is not some phenomenon off in the corner that may or may not be able to perform, that may or may not be secure, that may or may not be good for our children. It's not a phenomenon. It's not C.B. radio, it's mainstream, and people are beginning to learn that. People are beginning to see TCP/IP not as something for UNIX hackers but as something that can extend existing networks. People are starting to wonder about massive disintermediation. Anybody who is a middleman or a middleperson, whose role is to aggregate information, is really looking over their shoulder right now, wondering what their role is going to be. And people are spending a lot of time talking about bandwidth; without it, it's not a lot of fun. And will there be enough bandwidth to do the things that people want to do?

In addition to this educational phase, a lot of issues make the news. Issues about security, encryption, privacy; issues about content rating and pornography. These are important issues, but issues that aren't yet really quite framed.

Now, where is this headed? Well, I'll give you just one person's view of this. I think by the year 2010, if not quite a bit before that, we will certainly see an Internet that is one Internet, a global Internet where all computers on the planet are connected to that one Internet. It will be a single network with portions of that network being protected; certainly with many of those systems being cordoned off behind firewalls, but nevertheless a single, global network.

We will see security that is not only understood but it is trusted and well-managed, something that people will take for granted. I think we will see open standards predominate; this is a very important thing to say, because I don't think we will see any vendor corner this opportunity that we all love so much called the Internet; I don't think there's room for proprietary thrusts to try to corner this and to make it into something that is developed behind closed doors. Electronic commerce, I believe, will be a major segment of commerce, not just an emerging segment but a major, significant one — hundreds of billions of dollars of commerce.

Software reuse is going to change the capabilities of IT to be responsive to our needs. Software will come across the network in reusable form, and will adapt as businesses and markets change. This “get connected” idea that I’ve talked about at Spring Internet World will be pervasive, and people will have complete access to companies and organizations, and those organizations and companies will have complete access to their constituencies, and companies who are responsive and agile will be prospering.

As individuals and as a society I believe that we will see an authentication of encryption, and will take it for granted and trust it. People will think of it just like we think of spell-checkers today.

The public will have access to the Web. I think a billion people, several billion perhaps, will have access to the Web, not with their own PCs, but through kiosks. People will take Web breaks off the plant floor, not smoke breaks. People will visit kiosks in their schools, their libraries, their churches... They’ll be in the jungle, and people will have access to the Web.

Bandwidth will not be a limitation. Today a 14.4 — think of that as a one-inch-in-diameter garden hose that delivers information to your desktop, and you know how fast that is at 14.4. By that time we’ll certainly have gigabyte capabilities, and one gigabyte is a 27-foot-in-diameter garden hose — and that’s the way we will think about bandwidth. It will be faster than our computers are today.

Physical communities will be based on lifestyles. You and I will live where we want to live, not where it’s close to commute to the people that we work for, because we will be able to work and collaborate on a completely geo-independent basis. We’ll live where we like to live, and the Internet will be a cultural and economic equalizer. Your next competitor may not only be in an industry that you never heard of, but may be from a country you never heard of.

So we have some exciting things here, and the greatest thing of all about this wonderful phenomenon that we all are so excited about is that you don’t have to wait for the year 2010. The future is now! All the things that can be done can be done now. It maybe a little harder, but you can do it. There’s an unlimited reach for business, an unlimited choice for individuals; it’s up to you and I to realize this wonderful future. It’s not up to IBM or Netscape or Microsoft or AT&T; it’s not up to any company. It’s up to the person on your left, the person on your right, you and I, to learn this technology, to share the excitement of it, to make a commitment to it, and exploit its tremendous potential.

So I think it’s a wonderful opportunity, and I think we should go for it and all “get connected.” Thank you.

Mark Lonergan: Thank you, John. I gotta tell you it was like pulling teeth to get him to install Microsoft, and particularly difficult when he discovered that once you had put Microsoft software in your hard disk, it never comes off.

Next I would like to introduce David Garrison. David is the President and Chief Executive Officer of NETCOM Online Services in San Jose. David — just a little bit of background on him — is a graduate of the Harvard Business School here in nearby Cambridge, and also has a B.S. in accounting from Syracuse University. Prior to his work at NETCOM, David was the President of Skytel, a worldwide paging company and division of MTEL in Jackson, Mississippi. And before that David was the Chief Executive Officer of a company called Dial Page in Greenville, South Carolina.

David is best known for both his career-oriented and non-career-oriented achievements, the latter of which include his work with Habitat for Humanity in Central America, and the sales and marketing job he did on his family in order to move from Jackson, Mississippi, to Los Gatos, California. If you’ve ever shopped for houses in Los Gatos, California, you know that was a heck of a job. David Garrison.

David Garrison: Thank you, Mark, and good afternoon, everyone. I'm a relative newcomer to the Internet, but I have had the opportunity and privilege to be in on the ground floor of a number of existing industries, and I think my comments and conclusions today will be biased by watching the cable industry being born, by watching the cellular industry being born, and now being in on what I consider the ground floor of perhaps the most significant development since the introductions of the telephone and the PC. So my bias in watching these other industries evolve will be reflected in my comments.

One of the things when you think about 2010 — as we're sitting here fifteen years from 2010 — one of the things we realize is that whatever we say today will be wrong. People say, "what's the future of your company?" I can lay out any future you want, but what I know for sure is it's probably going to be wrong, because we can't foresee the evolution of this business. So I say that because I want you to be aware that I realize I'm wrong in whatever I tell you about the future.

And I can tell you this because I've gone back to do my research, because I've gotten a time machine and went back fifteen years to understand some of the things people were saying. Perhaps Kenneth Olsen at DEC in 1977: "There is no reason for any individual to have a computer in his home." That could have been at this conference!

You think I'm going to make smarter comments than that?

But he's not the only one. I'm not picking on DEC, even though it's a local company. "Electronic mail is a totally unsaleable product." This is fifteen years ago, and remember electronic mail was not at a dissimilar stage from where the Internet is today and one could say, "Well, look how clunky it is, look how hard it is; you have to know commands..." A lot of things that could be said about the Internet today.

But it doesn't stop there. Alexander King at the Institute for Advanced Studies stated, "Ninety-five percent of us will be out of work by 1999 because of micros." And it's a plausible thing, if you take artificial intelligence and you project out the advances made.

I also remember I was told as a kid that we'd all have these backpacks like the Jetsons and we wouldn't have cars anymore, and we would all be kind of jetting around. But it's something about jet traffic control and airspace that stopped that one.

Other statements... Bill Gates, of course, in 1989 said "640K ought to be enough for anybody." I don't even know that your PowerPoint program could work on 640.

So that's why I come to you and I can say, "Look, I can talk about fifteen years from now. What I guarantee you is, I'll be wrong." I certainly don't have the intelligence of all these other folks who have made these wise prognostications in the past.

One thing I have concluded from watching these other fields being born is that it's not technology-driven. We see technology, and then we go on these wild projections of what this technology means. What I believe is the greatest variable in predicting the future is not technology, but in fact it's human behavior. It is answering very basic questions like, "How much does it cost, what does it do, why should I use it? Is this something new you're trying to convince me to do, or is it just an adaptation of something I do already?"

The rate of adaptation determines the viability of the application of technology, if you will. And that adaptation is how people in their everyday, commonsense lives answer those fundamental questions. It's not about, "Look at what this technology can do!" Frankly, nobody cares. In the conference it's very exciting and we'll all be abuzz for about three months about whatever is announced here, but the fundamental issue is, what does it mean to the end consumer, and why do they care?

I think that the test obviously has to be that the technology has to have obvious benefits, and serve a broad need, before people will adopt and embrace it. While there are no startling

revelations there, I think it is very important to remind ourselves of that, because sometimes we get all caught up in the technology and the breakthroughs that that exciting technology represents, but forget to ask some of the basic questions.

One of the things that's made the Internet so exciting, of course, as we look at it from a customer's viewpoint, is that we have taken away the scary UNIX commands from the average person. We have begun the process of demystifying the Net, and I think it becomes an obvious information and productivity tool for one major segment, and an entertainment source for another major segment of the population. And I think that's one of the reasons that our company has been blessed with this 460% growth.

I think, though, as we have seen in other places — for example the PC — that the software capability has truly lagged the hardware capability; we are still in a catch-up mode in the PC. And let me give you two examples of the PC, and how it relates to my comments that human behavior is what will drive it and that software lags.

If you look at the uses of most PCs on desktops today, I would venture that you would find two things. One, most are underutilized. Right? I can't tell you, as I go around the country, how many offices are playing poker. The incidence of electronic poker has skyrocketed, and I can draw a direct correlation with the introduction of the PC. We've got an enormous memory, enormous capability, without the software to use it.

The second thing is that the PC has basically taken the calculator, what the HP-12c can do, and put it on steroids. It's a lot more friendly display, right? But basically it's an HP-12c on steroids with a friendlier display and more memory. It is also a very juiced-up IBM Selectric typewriter. Haven't seen one of those in a while, but you do see a PC. Why is that? I think it's because those are the commonsense applications that the average person says "Yes, I can do this on this box."

But I don't think we have begun the PC revolution yet, because we haven't found beyond those two areas, we haven't found for the average person the real application, which I think will come along as we push the software edges and as we continue to push technology.

So with that as sort of background, let's see what it means for the future of the Internet. I think obviously it's evolving; we know that. We don't know today what it will be like tomorrow. It's interesting to see TCP/IP, as a protocol, is a fairly recent innovation. And as we have heard before from John, we agree the best bet will be open and flexible standards. That's why our company pioneered in direct Internet connectivity, and why we've said if you don't want to use our browser, what we are providing is a platform; you can plug in Netscape or other programs. That's because we believe that ultimately it will be about the customer's ability to customize the software around their own NAPs, and in fact, we will have many different types of Internet uses.

All that is background; let's move on to predictions. First of all, the Internet will be ubiquitous. It will be ubiquitous, but it won't be as we think about it today through the paradigm of a PC, because the PC provides way too much capability for what most people will use the Internet and its potential for.

Simple examples: browsing the Web from TV, [which is] very easily imaginable. There will be many inexpensive, single-use devices. We talk about applets today, but what is interesting, we talk about applets in a software vein; there will be applets in a hardware vein as well, single-use devices that are very cheap, eventually throw-away devices, which will eventually connect to the Internet. It wouldn't surprise me if these devices, for example, are wireless, voice-activated, single-application devices that are driven around obvious customer needs and behavior.

Now, until we can see how the whole "wireless" part and the "applet device" part evolves, it's hard for me to tell you what those might be, but it will replace something we do

now and make it easier and better. I doubt it's going to be some entirely new human behavior enabled by the Internet; I think instead it will be an adaptation to something we do now.

And the third point here is that I don't — frankly, I am struggling here. I hear all this about shopping on the Internet, and I have a lot of respect for what John said about billions and billions of dollars, and I hear that from AT&T, and I remember going into the labs there five years ago and looking at the electronic mall and seeing all the neat stuff I could do to order goods and services... And it just doesn't fly in my life.

I mean, I'm sure there will be a segment of people, maybe who are catalog shoppers, where it just takes off; and I don't think that means that there is not a future for electronic commerce on the Net. I think that we might get confused between the distinction of "enabling commerce" and "conducting commerce." What I mean by that is, I think we will go through a shift from "buyer beware" to "seller beware," because the beauty of the Net, as we all know in this room, is the ability for people with similar interests and dissimilar geographies, dissimilar politics, dissimilar nationalities, dissimilar races, it allows them to connect around areas of common interest in many different groups. It doesn't pigeonhole you into saying you're an American, or you're a Republican or a Democrat, or you're a PC user or you're a UNIX user. We'll see many different connections here.

What does that mean? It means the companies won't have the ability to be unresponsive to customers, and they are going to have to do a much better job of responding to customers' needs. It means customers will be able to compare notes about products and services before they buy. It means customers will have much better access to competitive information; customers will have much better access to evaluative information about that product, so customers will get much better educated, which I think, perhaps, the single largest impact of the Internet will be on our economy as we become smarter about spending our money. I think it will result in enormous fundamental changes in our economy; but not necessarily because you order flowers or something else through the Net.

So I'm yet from Missouri on the issue of, "will we be buying billions of dollars' worth of things through the Net?" But I do believe it will create billions of dollars of value in GNP, because people will be much better educated about how they spend their hard-earned dollars because of the Net.

So with that as a sort of backdrop here, one more quote. Thomas Watson, IBM, 1943: "I think there is a world market for maybe five computers."

Thank you.

Mark Lonergan: Thank you, David. The next speaker that I would like to introduce is Marty Tenenbaum. Marty is the Chairman and Co-founder of Enterprise Integration Technologies, a company he recently merged with Verifone, and is based in Menlo Park, California. Marty has a Ph.D. from Stanford in both electrical engineering and computer sciences, and has both an undergraduate and a master's degree in electrical engineering from nearby M.I.T. here in Cambridge. Before coming to EIT, Marty held the Schlumberger Chair in computer sciences at Stanford University. And prior to that, in his earlier work Marty is well-known for his work as a Co-founder of the Fairchild Laboratory for Artificial Intelligence Research, better known as FLAIR.

I would like to introduce Marty Tenenbaum.

Jay M. Tenenbaum: Thank you, Mark. I'm a technologist, not a prognosticator, and I prefer to live by the words of my former colleague, Allen Kay, who said, "Don't predict the future, invent it." Fortunately and historically, fifteen years is about the minimum amount of time that it takes for events that we see emerging today to get into the mainstream of society, and so with

anything shorter than that we are likely to overestimate the results; anything longer than that, underestimate. Fifteen years is probably just about right. So let's see where we're going.

I just want to put a couple of technological assumptions up as kind of guideposts to where I want to extrapolate from. These look very consistent with what all of the speakers have said so far; namely — but I will say it in a slightly more provocative way — there is not going to be an Internet in the year 2010. There will merely be a Net, and this Net will be provided most likely from the telephone company or something like that. And all kinds of things will plug into it, for all kinds of different purposes. We've got the obvious appliances up there, from PCs — personal communicators — to TVs, but you can take the word “appliance” literally. Your coffee maker may well plug into the Net — and that's the real HotJava. Jim Gossling, who is the inventor of HotJava and the Java language, likes to talk about having enough IP addresses to be able to connect every light bulb into the Net, at least metaphorically, as kind of the order of magnitude that one is going to need for controlling things.

So there's going to be a lot of things plugged into this information infrastructure. Running on those machines are not going to be net browsers as you know them today; they are going to be applications of all kinds. You're going to be sitting there using your word processor and calling up documents that you want to incorporate; you'll be using a CAD system and calling up designs or analysis services and the like.

In terms of David's comment about wanting to have shopping be a richer experience than you get on the Web, these immersive environments, 3-D collaborative environments, will certainly put some amount of fun back into shopping, though I certainly agree that people are going to want to get together socially, at least hopefully.

The real legacy, the lasting legacy of the Internet — what we have accomplished, I think, over just the last couple of years and what I think is going to persist well into the 21st century — are these two items down at the bottom, “flat pricing” and “openness.” By flat pricing what I mean is that you will pay for bandwidth, the width of the pipe that you're using, and that might in fact be variable, but you will be not paying per call. The number of calls, the length of the call, the distance of the call, that's all flat. And the second is openness, the fact that anyone can plug into this thing.

Those two factors together are going to be some of the most profound economic and social drivers that are going to affect society.

The principal effects are going to be freedom and empowerment, unprecedented choices about where everyone can live, the kind of work you do, and as a consumer, the type of choices that you are able to make. You will be able to get hundreds of quotes, if you want, on an insurance policy, or get ten Lexus dealers to bid on providing you a Lexus. You will have the information that you need to make informed decisions, whether it be who you're voting for or what you're buying. And I think that is very consistent with what the last speaker said as well.

There are, of course, losers as well as winners, and I think the real estate industry is quite likely to be a loser. The prices of real estate in the financial district of Manhattan are already falling precipitously, even compared to the prices in the rest of Manhattan, and that's a trend that is likely to continue. I think we are going to continue to see some job losses in certain, perhaps financial, services industries and other kinds of traditional middlemen.

But the thing that's most unsettling to the stakeholders, the big businesses and governments, is what's going to happen because of the Internet's ability to level the playing field, and this notion of bypassing gatekeepers and crossing international borders basically at will. I think it is quite plausible to imagine the death of distribution monopolies, which have basically governed commerce ever since the days of the cities on the rivers dominating commerce, and right up to certain software companies dominating shelf space in software stores. That is going

to change. And in the very same fashion it is not at all clear that nation states will be able to continue to control the issuance of currency, be able to collect taxes and tariffs and so forth. So some really profound changes there.

I would now like to spend the next few minutes going through some specific sectors of society and commenting on what I think are really clearly trends from what exists today.

Starting from an area which I spent most of my time on, which is doing business on the Web, I have basically simplified my view of what's happening here to a single Chinese word; and that word is "crisis." And the reason why that's appropriate is because crisis, as shown in the calligraphy in Chinese, is the juxtaposition of two characters, one standing for danger, the other for opportunity. The danger, of course, is that anyone and everything is in danger of being bypassed, disintermediated. The suppliers, for example, once everyone is connected to the Web, can perfectly well deal with consumers directly; they don't have to go through merchants. Banks can deal directly with other banks over the Web; they don't have to go through "VisaNet." Merchants can disintermediate each other; so, for example, a merchant can get blindsided by a competitor they don't know about from around the world, or from a "meta-merchant," if you like, who puts himself up on top of the other merchants and simply says, "Come to me and I will go query the other merchants and give you the best price on a CD," or something that you want to buy.

So it's real easy for someone else to insert themselves between you and your customers; and the value proposition for these kinds of merchants is very, very compelling. The consumer places an order, and this virtual merchant doesn't do anything other than accept the order and pass it on to the distributor, who deals with fulfillment. So he has no inventory, he has no employees, he can do basically anything that he wants.

So these are the forces that are happening in commerce, and my contention is that very similar things are going to be happening in every sector of society. Take, for example, manufacturing. Today an engineer who wants to design something is typically sitting at his desk, working with colleagues and thinking about the capabilities that his own vertically-integrated organization can provide. That's not going to be the case once everything is connected to the Net; he will be dealing with all kinds of other services that are willing to license him designs that he can build on, [dealing with] analysis services where he can send the design, get it run on a supercomputer, get back a movie annotated by an expert, and then send the part out for fabrication. All those types of things, leading to a hundred billion dollar design-and-manufacturing services industry on the Internet.

The implications of that are many things, like mass customization and so forth. But I would like to dwell on one in particular, which is basically the disassembly of large, vertically-integrated organizations. Companies will tend to focus on their core competencies, because once you can go outside for services just as easily as inside, if you can get better price, quality and delivery on, say, a printed circuit board that you want built, that's where you'll go. And the company that used to have a printed circuit board shop will get out of that business and stick to the things it does best.

This provides tremendous opportunities for the small businesses that are going to be providing these services, and for them to act, in a virtual enterprise sense, as large companies themselves. A small shop can bid on a big job on behalf of lots of other shops that it is going to sub the jobs out to; or even the small shop that just has design expertise can put together a project for doing a new automobile and bring together all of the capabilities that it needs over the Net to go do that.

And switching to a whole other sector, I think about higher education, which is driven by some clear economic forces. It is going to have to change, and the change is motivated by things like declining budgets in the face of some declining enrollments. At the same time,

knowledge is exploding faster than the number of journals and the library space available to house them; and yet there are opportunities as well. While enrollment may be declining during the three or four years that people traditionally spend at a college, the opportunities for lifelong learning, “just-in-time” on the desktop, are increasing. And information technology is, of course, the enabler that is going to make that possible.

Let’s look at the virtual university. Take all of those constituencies that are represented by the university today, students and staff and professors and researchers and librarians and the like, and plug them together on the Net and imagine, in principle, a virtual university that might have a million or five million participants around the world.

The graphic, by the way, is from a really early example; this is Jones [Sinders] Cable Mind Extension University, and you can visit them on the Web.

So if you think about the kinds of services that might be available, a student starts by looking in a catalog for courses; they can get to see video snippets of what they’re doing, then register for courses or review their transcripts. Courses can be put together, national courses by the best people in the field, building on each other’s work, and then make those available on a fee-for-use basis, perhaps only in modules of ten minutes at a time, if you need that for just-in-time education.

Academic publishing is going to be radically changed with the ability to have on-line papers where people — these are multimedia papers — you make your data available, you’ve got runnable models. All of this sort of stuff doesn’t need physical library space, either, and as far as the administration of a university, this is a business, and just like any other business it can benefit from the kinds of choices and outsourcing that we talked about a second ago with respect to commerce.

Health care is a much different industry, on the surface, from universities, but facing very much the same economic forces. There are the constituencies in health care — everything from consumers to insurers, with doctors and nurses and whatnot in between — let’s plug all those people into the Net and basically have an on-line, virtual health services organization. And the kind of things I’m looking for there are, of course, patient data records on-line. But it is not like I want to re-engineer a national patient data record system; there’s plenty of patient information that exists today all over the place, but it’s just redundant or disconnected. And we would like to build federated systems, so that when someone comes into the cloud — like someone that you saw in the commerce slide — with the right credentials and authorization, they can get directed to the place that has the information and get it, thereby saving patients considerable expense and risk and discomfort from redundant procedures.

But more importantly is to take the patient information, add medical information and on-line collaboration, bring that all together, and you have the ingredients for profoundly better medical decision-making, all coming out of this same fundamental thing.

So I have two left; I’ll go through them quickly.

Publishing. Today’s print media involves very expensive procedures for being able to get a book together and publish it, and the control of the distribution channel is necessarily centralized because of the investment required. That really limits the opportunities for individuals to add value to this process, especially small, incremental amounts of value.

Let’s move ahead fifteen years and look at the emerging, what I call the “on-line marketplace” for publication products, in which basically everyone who is a reader is also a content provider, even people who never thought of themselves as merchants. Someone who just likes to write recipes or what-have-you can sell this stuff, and they can make use of any or none of the publishing services that they need. They can become their own publishers or they can make use of selected services that a publisher provides, whether it be editorial, illustrators, translators, or distribution or what-have-you.

The real opportunity is for the information intermediaries. With so much information available there will be a compelling need for people to provide all kinds of directory, referral, annotation and indexing-type services, and they will be able to charge for those things maybe a penny or a nickel or what-have-you. And with the number of people in the billions on the Net — right? — if you get one in ten thousand people to use your service, you will be very well off indeed.

Very much the same thing is going to happen in the broadcasting industry, where things are going to go towards not five hundred channels but five billion channels, where five billion might be an estimate of population in the world in 2010 — or maybe it will be ten billion if we're not lucky — and [it will be] highly interactive where, again, everyone will be a provider. You will be able to tune in to the "Marty Tenenbaum channel" for my fifteen minutes of fame that's once in your lifetime, if you might have gotten inspired on a particular topic.

Clearly these types of things that I've been talking about for the last ten minutes are going to have a profound impact on society. How big? Maybe this big... This is a quote from *The Economist*, a conservative and very perceptive publication not normally known for exaggeration. It's a comment on the Internet in a special issue; it says the impact is likely to be "ahead of the telephone and television, but behind the printing press and the motorcar."

Certainly makes for provocative reading. It is very hard, of course, to tell exactly how profound anything is going to be.

I think the important point to take away from this session is that this is a phenomenon that you cannot ignore. It is going to change the world, and the profound changes are going to come from the fact that everything that I have been talking about is not going to be something in isolation for the university, or health care, or manufacturing or what-have-you. All of these things are going on simultaneously, all connected to the same Net. And it is the unanticipated, indeed unpredictable, synergies between all of these phenomena going on simultaneously that are going to lead, as they always do, to the really profound changes in society.

So the fact that you're here is a very good sign. You will not be bypassed. Thank you very much.

Mark Lonergan: Thank you, Marty. The last speaker this afternoon before we go interactive will be Steve Levy. Steve, as many of you know, is the Chairman of Bolt, Beranek & Newman in Cambridge. Steve is a graduate of the University of Massachusetts with a B.A. in finance; he joined BB&N back in 1966, becoming its President and CEO ten years later. Steve grew BB&N from a small research and development company with national ambitions to an internationally recognized technology company that has become a true leader in the Internet, starting in the early days of ARPA.

Steve, aside from his work there at BB&N, is something of a fixture here in the Boston area. He is a former Chairman of the Massachusetts High Technology Council, was the Founder of the Massachusetts Telecommunications Council, Chair of the AEA —the American Electronics Association — and is on the Board of Overseers of the Boston Symphony.

I am also told he was on the Board of Directors at one point for the Federal Reserve Bank, District I here in Boston, so if you have trouble with your mortgage rates, he's a good guy to talk to.

Just briefly, at the end of Steve's presentation, he also has an extra presentation that he has gleaned from other esteemed leaders of the Internet, and I'm sure you will all enjoy that. Steve Levy.

Stephen Levy: Thank you and good afternoon. It is a great pleasure to be on this panel with Dave, John and Marty, and I want to especially thank Mark Lonergan for organizing this session and inviting me to participate in it.

Most of us who had the good fortune to be present at the birth of the ARPANET and its successor, the Internet, never dreamed that their development would take us so far so fast. Now, as we think about what might lie ahead, it is only natural to look back to see just how far we've come.

While fifteen years may seem a long time into the future, it really isn't. To put things in perspective, it was just fifteen years ago, in 1980, that IBM announced its plans for the first PC. Apple and other companies were working on microprocessor-based computers before 1980, but it was the launch of the IBM PC in 1981 which legitimized the industry for the rest of the world and served as the benchmark for the computer revolution that we are in the throes of today.

Just think of how much the PC has changed during the past fifteen years and how much it has changed the world. I believe that the Internet is likely to have just as profound an impact on the world over the next fifteen years as the PC has had over the last fifteen.

Remember those first PCs? They had a 4.77 megahertz Intel 8088 CPU, 64 kilobytes of RAM, 40 kilobytes of ROM, a 5-1/4-inch floppy drive and they came with MS-DOS 1.0. The list price was \$3,000.

I picked up the newspaper over the weekend just to see the going price for PCs today. In one ad, a top-of-the-line PC clone with a Pentium processor, 16 megabytes of RAM, a 1.6 gigabyte hard drive, a 15-inch color monitor, a PCI graphics card, a 28.8 BBS fax modem, a quad speed CD-ROM, and about a thousand dollars' worth of bundled software had a list price of \$3,000. The price tag is the same, but what's under the hood is light-years ahead.

The PC obviously also had a lot to do with bringing about the dramatic growth in networked communications, including the Internet as we know it today. Largely because of the PC, we have seen incredible growth over the past fifteen years in the software, semiconductor, electronics and communications industries. The application of products and services provided by these industries has in turn led to increased productivity and growth in many other sectors of today's global economy.

So what do I think the future of the Internet will look like in fifteen years? First and foremost, I believe that continued development of ever more powerful hardware and software, allowing easier and faster access to vast resources of information and entertainment, will within fifteen years make the Internet nearly as ubiquitous and pervasive as the telephone is today.

In fact, I wouldn't be surprised if some of the things discussed on the panel today come to fruition long before the 2010 time frame.

In the year 2010, the Internet, or whatever it's called then, will be accessible from almost any location in the world with extremely easy-to-use input and output devices, including, very importantly, speech recognition and speech synthesis. Your computer will likely be a fully integrated distributed system in your office, car and home. It would perhaps best be characterized by what is not around then; there'll be no need for a phone, no keyboard, no visible computer or teleconferencing device in your office. At home there will be no TV, no VCR, no stereo, and perhaps no newspaper; instead, your fully-integrated, digital distributed system is part of a web of such devices that satisfy all of your "infotainment" needs. It gives you what you want, where you want it, when you want it.

Physically it may take the form of a large flat panel display with a color camera, 2-D microphone array, huge-capacity hard drives and giant RAM configurations. These infotainment units will appear as slim, non-obtrusive wall-mounted or desk-size picture frames, and sell at prices comparable to today's PCs and workstations. With them, in the year 2010, users will be

able to request anything the Internet can offer in its millions of databases and servers: virtual reality, full-motion video, and digital sound.

While we're speaking about price, the cost of accessing information from this vast digital repository will likely also change. Already we can see the start of a move away from free service to fee-based facilities. Unlike today, the Internet connection may be virtually free, but increasingly companies will charge users to access certain of their Internet-based resources. The free Internet services will be very robust; they will include facilities for electronic commerce, multimedia publishing and an underlying, secure network infrastructure.

The Internet will also grow in new ways that we cannot yet comprehend. Each new technological advancement will point the way to even greater things. The Internet will speed up the rate of new software development, because engineers will be able to find and retrieve reusable code from multiple libraries on any subject. This is already starting to happen; and the resulting products will shape how we access and process information in the future.

Interacting with the Internet will get much, much simpler. Users will be able to select a front-end they feel most comfortable with, be it a Web-like interface, speech recognition or some kind of virtual reality. Internet search and retrieval tools like *Yahoo*, *Lycos* and *WebCrawler* are already having a profound impact, and we are just at the first stages of search and retrieval technology. Multimedia search capabilities will be routine in the year 2010. Speech recognition will free users from manual typing, and intelligent search agents will travel the lengths of the Internet to uncover information that users are interested in and customize it in a format that is pleasing to the recipient.

The Internet of 2010 is likely to be used more for entertainment and leisure than for work. We are already witnessing the convergence of information and entertainment; in 2010 it will be seamless. The convergence of HDTV, computing and communication will make your home or office a virtual theater.

On each wall may be a three-by-four-foot infotainment unit, and a 2-D microphone array will automatically focus on your voice and minimize the effects of reverberation, and thus you will be free to interact with the system from anywhere in the room. It will recognize your voice and accept commands spoken in natural English, and speaker authentication technology will make sure that only you and other authorized users have access to the system.

The unit will have an extremely powerful computer "mother chip" built into it. It will also have enormous memory and be connected from behind to AC power and a fiber-optic cable, which will be connected to a terabyte router in the basement of your building, where it is in turn connected to the Internet.

The unit will contain very powerful "knowbots," or knowledge robots, and executive assistant software that enables the unit to learn your likes and dislikes, how you do your daily work and what your preferences are. It will select and customize your information and make recommendations accordingly.

Libraries of films will be at your fingertips. If you are interested in a movie, you can take advantage of the system's video-on-demand capabilities. You can scan through a virtual *Lazy Susan* containing thousands of movies, and can preview any of them; When you find the movie you want, you can purchase a virtual ticket. Just as movies will be available when you want them, so too will concerts, lectures and sporting events.

Interested in World Cup soccer? You will be able to access not only the latest game results and high scores, but also have daily packages of highlights transmitted to your home.

In short, your neighborhood will be global in scope. The opportunity for using the Internet for leisurely pursuits will be astronomical in 2010. Every special interest will have a forum to share information and opinions. Take mountain biking, for example; in 2010 the Internet's mountain bike forum may help you plan your next trip. You can preview different

riding spots, strap on a virtual reality helmet and take a ride as well as talk with other people who have ridden these courses. You can also search the network or, rather, have the network searched, to find hotels in, say, the Lake Tahoe area, that offer package deals for mountain bikers.

While we're talking about trips, you can set one up easily through a live connection between you and your partner using video-conference technology and virtual travel agents. You both review your itinerary on-screen, you from your living room and your partner from his or her office. Using speech commands, you can specify the cities you want to travel through and can call up video for different points of interest and participate in travel discussion groups.

Once your plans are firm, the same system will let you purchase tickets for flights, as well as for museums or shows, and make reservations at restaurants and other stops along your trip. And if you have questions, an on-line travel agent will come on the screen to explain, for example, which countries require visas and which don't.

As you would expect, kids will continue to be very heavy users of the Internet fifteen years from now. They will be able to search the networks for thousands of multimedia and virtual reality learning programs and entertainment games. Perhaps your grandson will learn to read with the assistance of a program on the Internet which encourages him to read aloud while it corrects his mistakes, fills in words he doesn't know, and gives him new books to read and shows him interesting places and things.

Well, that's my somewhat fanciful image of the Internet and related information technologies in the year 2010. In the interest of time I won't elaborate further on how we might use these tools in our work in the future; however, I do believe that their use in business and commerce will be pervasive, mainly because we won't have to be technologists to enjoy the tremendous benefits of the Internet and other information technologies I have tried to describe briefly for you this afternoon.

But that's enough of my views of the future. I thought I would close by showing you a brief video of what some real experts think about the Internet, and how they think they might use it in the future. Thank you very much.

Presentation

Girl: And if you're looking around the Internet, you'll find me at zero, which is not my I.Q. number. Well, the reason that the Internet has attracted many other people is because adults tend to like TV better, because the Internet involves, you know, everything. You know, it involves using your mind, which younger people tend to enjoy more than older people.

Boy: I never watch TV. It doesn't change my life, it's something to do when I'm bored. I'd rather do Internet because I get to actually be with my friends on Internet. And if I'm going fishing, I can only be with a couple of my friends, but on Internet I can be with all of them at once.

Boy: One thing I like about the Internet is the "call therapy" thing, because if you're just a kid and your friends are all into the Internet, and you would like to go explore it to see what it is and you ask your parents, "can we get a computer with a modem and a phone line hookup to get on the Internet?" and they say, "Oh, well, how much does it cost?" And you say a computer costs about \$1,500 and a modem costs some, they say, "No, that's way out of the price range for me."

Boy: There's a girl I know, and she has a boyfriend on the Internet. And I don't know if he's still her boyfriend, but as far as I know he could be completely ugly and yet he's her boyfriend because they talk to each other on the Internet. And they create posters on the Internet about, like, "Dynamite loves Sphere."

Girl: I just like talking to people. You know, people, because people say "hi" to me and they gave me some information, like about school. When I was in school I was having some trouble with the work and stuff, so I was talking to one person and he gave me some information on what I should do, and he said, "You are ahead of a lot of people because of your age, and anyone your age should be proud of that."

Boy: Our parents, they're used to using telephones and watching TV instead of using the telephone and TV sort of mixed together. My mom was the one who got the computer, but I'm the one who uses it mostly. She does business stuff on it, but she doesn't use the modem a lot. I was showing it to my parents last night and they weren't really interested; but of course this was like 10:00 o'clock at night.

Girl: The reason I like the Internet is because you get to create worlds of your own. You get to build up social skills and physical skills — your fingers get really tired, I have to tell you. But it's worth it. The Internet, you know; I mean, I laugh a lot. I mean, it's really funny because a lot of the stuff people say is funny, so if someone was watching me, they would see me giggle.

Boy: I think the Internet is going to go very commercialized soon because you can already see it happening and stuff. Like you can see a Web server somewhere where you can order a pizza or something — there's a Pizza Hut Web server somewhere, and you enter your home phone number and your name. So I think eventually the Internet is just going to become a big commercialized thing. Then they're just going to have to make a new network for public use.

Boy: For the guys who're the ARPANET pioneers, I have to say that they're pretty much geniuses, because 25 years ago no one would have ever thought of anything like this. But people, most people didn't even own a computer, so people would never have thought of computers through the phone lines. And I think to just even imagine that, not even to create it but even to imagine it, you have to be a genius.

Mark Lonergan: Just a brief story. It's interesting; my oldest son is about to enter high school, and he recently went to High School Night in northern California, and he was being presented to by five or six different high schools in the area that he had to choose from. And the first question — I mean, the adults all had the typical questions, how long is the school day, how much homework do they get — the very first question that all the kids wanted to know was, "tell me about your Internet access." Clearly, these kids are going to become the leaders in the future.

Before we get started on the question-and-answer segment of the meeting, let me take a minute to describe a couple of ground rules for the interactive portion of our event. In a unique symposium like this one, it might help if we added a couple of rules of engagement to help the process get started.

First, as my grandmother used to say, we're not here to sing duets and make fudge. There's a great deal riding on this phenomenon for all of us, audience and presenters alike, and

it is my duty to ensure that we engage constructively on some of those possibilities and explore as many of them as we can in the short amount of time that we have allotted.

Two, we're going to hope to keep the discussion at the 30,000-foot level; the better that we can talk, as the four of these gentlemen have already, about events in the future to give us some view of the context and the expectations for that time, I think the better we'll hope to serve you who attended this meeting today.

And then, finally, many of you in the audience, particularly the younger members in the audience, truly do represent the leaders-to-be in this important Internet world. With that much at stake, I encourage you to challenge these visionaries in their view of events to come in the audience participation segment, and we'll leave plenty of time for that at the end.

So let me start off — I guess I would like to throw open a question to any of the four panelists, and you can pick it up as it makes sense. It is interesting; I don't think I heard anybody during the discussion today talk about regulation or regulation issues as it relates to fifteen years from now. Any thoughts?

John Patrick: I think there are a lot of regulatory threats to the Internet, but I'm quite optimistic about this in the sense that I believe the industry can work on the issues that are the potential things to be regulated, and avoid the need for regulation.

I really don't see regulation as being helpful in any possible way. On the other hand, there are some real issues that have to be dealt with, so I think it is really incumbent upon all of us in the industry, while we may compete on many things, to cooperate on certain things. For example, in the area of pornography, [we need to] to devise technologies for content rating. There is some very important work going on at M.I.T. along those lines, and there's a working group of a number of companies, all competitors, working together to try to solve that problem. And I think as long as we coalesce around those key issues as an industry and focus on solutions, the need for regulation will go away.

Mark Lonergan: Anybody else?

A key question I had... I was talking to some friends not too long ago, one of whom is a stockbroker in northern California. The question that he had, given the topic and kind of the visibility that the Internet has gotten recently, is what kind of stocks should we consider putting into our IRAs in the year 1995? And perhaps even more importantly, what stocks should we be taking out? David, I'll let you start with that, since your stock seems to be doing so well.

David Garrison: I have an idea; I would put NETCOM stock in my kid's IRA! I would probably also — I think there is an interesting bias going on — John, you caused me to think about this. All computers will be connected to the Internet; I wonder if that isn't limiting, as a thought, because I think about computers together — some computers have keyboards, and that's the kind we tend to focus on here. But just as important are the smart chips, for example, when you slide your hotel room key in and pull it out. You know, that's a computer just as relevant to the average person — that is, the average person who happens to travel and stay in hotels — as is the computer with a keyboard.

The reason for saying that is I think that companies — perhaps like Intel, as long as they can leverage their lead in terms of economies of scale in chip development — will play a key role, because chips will be some of the applet building blocks we see in the future.

John Patrick: That's a very good point; all things with IP addresses [will be] connected to the Internet. When I say all the computers connected to the Internet, almost everything will have

an IP address: vending machines, your refrigerator, maybe toasters. We'll all have IP addresses, and that's what's going to make up the Internet, the interconnection of devices.

In terms of who to invest in, I don't know. I guess I think it's really hard to predict based on what people do today. I think it is going to be companies that are able to move fast and identify trends that will be possible because of the Internet, and who see the market. Those will be the companies that will prosper, I think.

Stephen Levy: Well, I would agree. There are going to be, as a result of the continued, rapid growth of the Internet and the fact that it makes small companies as visible as large companies, there's going to be a huge number of opportunities for companies that haven't even organized themselves today to be extraordinarily successful companies by the time we get to the year 2010. People who are building specialized databases are going to find a tremendous resource available to them through the Internet, a world that may want access to their databases. There are going to be people who are building and publishing all kinds of different services and helping figure out what it is that you would like to see, and publishing those as specialty groups, whether it be on travel or on the stock market.

There are obviously companies that are going to be building various kinds of hardware, communications companies that are going to over the next fifteen years continue to prosper as everybody fills out their information network. We have seen a number of examples of those already. Clearly a lot of the beneficiaries of the early work in networking have been the router manufacturers, and now we are starting to see other device manufacturers are prospering as a result of that.

So I think, from my own vantage point, that I see it as a wide-open world, and there are going to be many, many new companies that are going to be created; and given the way the venture capital world works and the IPOs work, I think we'll have a lot of opportunity to invest in those companies in the future.

Jay M. Tenenbaum: I think, realistically, that things are progressing in waves, and you had your opportunity in this past year to invest in the on-line service providers like NETCOM and BBN, who have also benefited during this year. We also saw the emergence of the companies that are providing the software for being able to access the Web at a base level, companies like Netscape and Spyglass. I think in the coming year we're going to see companies emerge whose job it is to kind of flesh out this infrastructure. We don't need necessarily more connectivity providers and Web browser companies; what we need are the companies that are going to deliver what it takes to make this stuff real.

And by "real," take the case, for example, of payment, which is something that I am going to be focusing on increasingly after my merger with Verifone. There are any number of payment solutions and none of them are really very compatible. You see the kind of competition that exists in the press between MasterCard and Visa to try to lock down the credit card standard. All of this stuff is going to be made invisible, not just to the consumer but the merchant, probably the bankers, or else they are going to just walk away from all this stuff.

So Verifone is going to spend a lot of time doing just what they did in the kind of countertop machines that you swipe your credit card through to get it authorized, namely to produce the software for the merchant and the consumer, and the bank that kind of pastes over the differences and complexities of all these standards. And the same thing needs to be done in every other field of the Internet to make the thing real. What we have seen largely up to today are neat demos of the potential of this stuff.

Take security as another example. It's one thing to have been able to demonstrate putting together RSA public key algorithms with Web servers in order to be able to show that

you can pass a credit card number more or less securely over the Net; but in order to make this stuff real on the scale that it's going to affect mass markets, we are going to need to see a whole infrastructure built up to be able to issue public key certificates that certify that you are who you say you are, and that are able to verify these things in real-time after each transaction, escrow them after you lose them and provide some kind of liability if you're not who you said you are. And on and on... These solutions are going to come from many different companies that are going to be fleshing out every angle, so there's going to be no end to investment opportunities. The one thing I would like to emphasize is that you should keep your eyes open as these trends start to emerge, and invest in the companies that look like they're making some progress.

Mark Lonergan: In the discussions that happened already, Marty, you talked a little bit about the fact that large companies, large communications carriers, are likely to bring us the Internet or to act as integrators in that. David, I thought you might have some ideas on that — unless you plan on being one of those large companies. How will the communications connection take place in the year 2010?

David Garrison: Mark, I think it is way too early to tell. Part of it is dependent upon the technologies that — for example, my son and I have addressed different devices so that we could remotely control our home devices and other things. That will in part determine the communications bandwidth that we need, which will in turn determine how it is we connect.

Isn't there massive consolidation happening? Won't NETCOM and other providers be wiped out by very large companies coming into the business? I think the answer is no. The key to this is not having a big balance sheet. I think the key is innovation and listening very carefully to the market, and being very flexible as the market proceeds. So 2010 and network? I don't know; we'll see. Ask me in 2009.

Mark Lonergan: By that time you might be buying U.S. West and seeing what it's like to live on the other side.

A couple more minutes and then we'll open it up for the audience. We'd love to have you participate; I'm guessing we've got some AT&T people in the crowd that might have some strong thoughts. Well, shall we do that? Let's do that now. Let me take a question from the audience, please.

M: I would like to ask a challenge part which relates to Mr. Tenenbaum's statement concerning the trend towards flat pricing. The challenge part is, I don't necessarily see a trend towards flat pricing. I see a lot of surcharges being applied to all sorts of different services, and that doesn't fall within what I would consider flat. And the question part is, your flat pricing trend that you're predicting, how do you feel that applies to intellectual property?

Jay M. Tenenbaum: I was talking about connectivity, for example. I think that for people who are going to tack on surcharges for things that relate to connectivity, they're simply going to get bypassed by people who are willing to provide pricing based on what the actual costs are.

But for this question we have two experts on the panel who are in the business, so I would yield to Steve and David to comment on it.

Stephen Levy: I agree with the gentleman who asked the question. I think that, as I said in my talk, pricing for content is going to change and we are going to start paying by the "click" for the kinds of services that we use. If we access a specialized service, we will start paying for that

service. And I would expect that in the near term, over the next couple of years, we will continue to see the cost of access decline.

I think I would agree with Marty that in that period of time we'll start to think of the connectivity as something like digital dial tone, where it's always there if I need it and I pay for it as I use it. But in the use of the Internet, we will continue to be able to do applications like electronic mail and publishing and so forth. But when we start to use services like entertainment services, games and specialized educational programs or specialized databases and so forth, we are going to be paying for that based upon what the vendor thinks that they are going to be able to extract as value for that.

David Garrison: I think that one of the things that we find over and over again, again coming back to customer behavior, is that customers like predictability. They don't like to be surprised and they don't like people looking for handouts everywhere they are. I think that one of the models we see, for example, is in cable television; we can just select the channels we want in cable TV. We could say, "I want CNN, I don't want the Weather Channel, I want this, I don't want that." But it becomes a commerce nightmare from the standpoint of billing.

What's happened in cable is very interesting. There are many people who will sell you services for ten bucks a month. As a practical matter, here in the U.S. specifically, people have selected two services, those being movie services, HBO and Cinemax and The Movie Channel. Depending on how you look at it, two horizontal services have survived out of all the services that can be ten dollars a month, and that is observation number one.

Observation number two is "connectivity provider." They say you guys at NETCOM will be a dial tone; I disagree. I think we are going to be a conduit and an intermediary between the content providers and the customer, just as a cable company is today. They bundle things into satellite tiers so you pay four bucks a month flat rate, and what you get is CNN and The Weather Channel, and you get products A, B, C, D and E. And we are seeing companies like InfoSeek offering services around pricing that tends to be 10 or 15 cents.

And I think the content providers will have to adopt flat rate pricing. I think that there will be aggregators who are not aggregators as we know them today, but distribution aggregators who will package that for customers and be the intermediary between different kinds of content providers and the customers who say, "Don't hold your hand out at every stop on this Internet stuff. I want predictable value. I want predictable pricing." I think we've seen this in other technologies and I think we'll see it in the Internet in the very near future.

John Patrick: I would like to add something to that as well. I think there is a tendency toward thinking of access or conductivity as just a simple thing that will become "commoditized," that it will be either free or there will be an Internet dial tone there for 50 cents a month or something. I think that's very misleading to think of it in such a simplistic fashion.

There is a range of things that go along from that dial tone to what people really want to do. A lot of that will be provided by various companies, BB&N and NETCOM to my left and right, ourselves at IBM, and many other global networks. People will find ways to deliver the value that customers want, particularly in the business environment. As companies use the Internet as a way to extend the networks they already have inside of their business, they are going to have a lot of demands that are not being met by anybody today.

I think the networks that exist in companies today, SNA, NetBIOS and IPX — there's many different kinds of networks and they're not going to go away for a long, long time, if ever; but they will be extended by the potential of the Internet. And as this extension occurs, there are going to be new classes of services companies. Today's Internet will not meet those needs.

It does not have the security nor the industrial-strength capabilities that business customers will demand.

So I think we will see a lot of innovation and a lot of escalation in the capabilities of the Internet, with redundant paths and with a merging of what we take for granted today as a simple router. You know, just plug in a router and connect it to the Net. Routers are going to become very sophisticated in the future, and certainly by the year 2010 routers will be blurred with servers, and firewall and multimedia capabilities will be part of those routers. It's all going to come together in a very sophisticated server that will enable the business customers of the world to reach out and connect their existing networks to a much broader constituency than possible today.

Stephen Levy: I think John and Dave make a very, very good point. The focus of this panel has been on the year 2010 and what the world might look like in the year 2010. However, the world doesn't look that way right now. Our company, our Internet service provider, BBN Planet, provides services principally to businesses, not to individuals, and what businesses have is very, very complex network communications systems in place already. They are distributed all over the world, and there are all manner of networks that have to be connected together. It's going to take many years to rationalize that complexity.

And that's the service that an Internet service provider such as ours can provide today to those businesses, to rationalize that complexity for them, to interconnect many of their dissimilar networks and ultimately to connect that up to what we think of as this ubiquitous Internet today.

And that is very complex. It requires network management skills, network integration skills, the ability to run Web sites, large Web sites, and the ability to deal with foreign PT&Ts around the world. We think we have a "U.S.-centric" view of the world, of the Internet, but the rest of the world is not as far along in terms of the use of the Internet, although it is coming along quickly. If one views it as a multinational company, one views the needs of a multinational company as having offices all over the world; those offices are connected by many PT&Ts and many networks, and the service provider has to rationalize all of that for his multinational customer.

David Garrison: If I can add just one comment to that, regarding copyright. Our company, as some of you may know, is currently being sued over the activities of a customer of a BBS where the BBS was then a customer of NETCOM, and some of the information that that person allegedly put up on the service allegedly violated copyright laws, et cetera, et cetera, et cetera. We are being accused of being liable for violating the copyright laws, which we strongly disagree with.

The issue here is much like if you were running a restaurant, and you would have to bug every table and listen to every conversation being held, and if any slander or libel occurred [you'd have to] run around and go issue a ticket to the person and say, "I'm sorry, you have to leave my restaurant right now because you just slandered somebody, because I am the controller of all information."

And we believe that, at the core, that is exactly what the Internet is not. I can't control all individuals. I will enforce known copyright violations. I will enforce it if I know that it is happening, if it is a persistent violation; but I think what we are being asked to do in this lawsuit is a challenge to the freedom of the Internet, and I think it is a challenge to the way that this technology will evolve.

I think very strongly about copyright, so I didn't want to let that question go by without offering that thought.

M: It sounds like the model that you have all talked about is one of special-interest providers putting packages of content together. On the other hand, if you look at literature, the paradigm in literature is really the library system. So imagine a Dewey Decimal System, if you will, for IP addresses, where that morass of information that's out there, that chaos, is put under some amount of control so that people can do reasonable searches on it instead of that provided by a special-interest content provider. What do you think would be the impact of some type of global approach to organizing information?

David Garrison: Bring it on! It would make it much easier for customers.

Jay M. Tenenbaum: I think the wonder of the Internet is that, "who knows?" But why don't you go try it; it won't cost you all that much to get started.

Personally, I think that what will happen, actually, is that it's likely to happen not in the sense of a centralized Dewey Decimal System, and not in the sense of a centralized directory like a *Yahoo*, either. I think what's going to happen over the coming years is that we are going to see lots of specialty organizers of information [working] in areas of content that they care about, doing a very careful job of organizing things that are meaningful in one field or another, and they will charge people for access to those services. Or maybe they will use that as a way to bring in users from a particular community and then be able to turn around and sell to national advertisers who want to reach that community. This is just another example of an aggregator, in a sense.

So, by all means, go do it. I think Dewey Decimal in particular is much too limiting for the dimensionality that we are talking about here; it's a much more complex space.

John Patrick: I see it that way also. It's hard to imagine a Dewey Decimal System for everything on the Internet. That would be basically a cataloging of all information, and I'm not really sure how useful that would be; I think it is a lot more useful to have communities of interest that provide value to people around that community. Take something simple, for example, like one of my favorite sites, the "Micro-brewery and Brew Pub Guide to the Internet." Somebody who's interested in beer has created a site where he has catalogued micro-breweries and brew pubs around the world. Well, that's really valuable to people who are interested in beer, but it is certainly not something that probably would fit in the context of a Dewey Decimal System indexing of all information in the world.

I think the brew pub thing is a more likely valuable kind of a thing than trying to index all information.

Jay M. Tenenbaum: There will be an ecology of these things. Someone will do brew pub and someone else will care about restaurants, you know, and he may point to these things. It will be a big mass ecology, and that's what the Internet is about.

M: It's an interesting sort of dichotomy coming out here. At one point I was hearing disintermediation, and then at another point I was hearing reintermediation. We're going to have new intermediaries. Maybe we could just open up for a bit of discussion among the panelists. Who, in their opinion, may be the first ones or the ones they see being disintermediated, and what new intermediaries do you see coming in the future? Sort of what Marty was saying in his talk, and some of the comments David has just made. Maybe we could just generate a little discussion around this.

Jay M. Tenenbaum: This is getting directly to my comment about danger juxtaposed with opportunity. The point is that anyone who is an intermediary today is in danger of being bypassed. And virtually everyone, at the same point — if they understand what's happening right there — has the ability to be able to gather much more market share globally than they ever had before. That really is why it's very important to get plugged into what's happening, to go visit sites like CommerceNet, for example, which is an organization I have had something to do with, which is trying to just open the eyes of the members to what these dangers and opportunities are.

Mark Lonergan: That raises an interesting question. A couple of you referred to the fact that companies can be started and run almost like virtual corporations with entry and dropout varying dramatically. A question I would like to hear you talk about is, what are the sustainable competitive advantages that people are going to be able to use to hold on through the Internet? In other words, how do you use the Internet, if you're already a business that is thriving, to sustain that competitive advantage without worrying about the new guy in?

John Patrick: I'll take a crack at that. I don't think there's anything that is really sustainable; I mean, this is a technology which enables anybody to get into any business from anywhere, so nobody can be comfortable in the business that they're in and think that it's going to be sustainable unless they are evolving with the Internet very rapidly. Disintermediation is going to happen, and it will happen by necessity because the Internet makes it possible to happen. The technology makes it possible.

I might differ slightly, Dave, with your point about the idea that technology doesn't drive it. I think in many cases technology does drive it, because if it can happen, it will happen. And as soon as somebody does it, if everybody else doesn't do it or do it better they're going to be on the outside looking in.

I think businesses today, in terms of what this means for them, it means they've got to get connected. A business without a viable, compelling presence on the Web will very shortly, in months, be like a business with no fax machine: they won't be a business. And so it's not a matter of whether this disintermediation is going to happen; it's going to happen. You've got to get out there and get connected. If you're in one of those middleman roles, you have to redefine your role and find a way to provide value.

And I think the way businesses will do it is by extending their reach. From my point of view this is all a matter of reach, reaching constituencies that you couldn't reach before and using the Web in effect as a GUI into existing business systems, so that whereas today you're limited by whatever kind of a computer you have and whatever kind of protocol your terminals or PCs use to connect to that computer, that's going to become irrelevant. The Web will allow any person with any kind of a browser to be able to come into your business system and get the information you want them to get. It's a great opportunity.

David Garrison: Marty had commented before about the death of distribution monopolies. I think that is particularly true as it relates to information; but as far as physical products are concerned I would probably differ. I'm just trying to think about my own life, and what I buy. In most cases, for everyday purchases, I think the cost of transportation will be so great that we will maintain what we know today as "physical aggregation places," or stores, the K-Marts and the Wal-Marts of the world. The brands may change and the goods may change, but the cost of transportation means that it will be a significant issue. Even if I could order it through the Net, the cost of transportation, I think, will be significant enough that I won't get it delivered one-off.

Stephen Levy: That's true, Dave, of physical goods. But if you think of services like travel services, there isn't really any reason to go to a travel agent to have Net travel services done.

David Garrison: I agree.

Stephen Levy: Or a bank. Or think of entertainment; there will be no reason in the future to go to a video store to get the movie that you want to watch.

David Garrison: Or to this conference.

Stephen Levy: That's right!

Jay M. Tenenbaum: That's not so good for all these hotels and restaurants, is it?

But one thing you did say, you said Wal-Mart. Sure, physical distribution is going to be very important, and yet if everyone is on the Net, it is going to be relatively easy for suppliers to offer the kinds of services to small merchants that today Wal-Mart demands and gets because they invest \$12 million a year in their private satellite network. Companies on the Net, suppliers on the Net, can manage the inventory of a small mom-and-pop just like they can Wal-Mart, and so I don't think Wal-Mart's position is necessarily safe.

Mark Lonergan: Let me see if I can help repeat the questions just so everyone can hear. In the back? Did you have a question?

M: Yes. Can you relate to the Internet how some of these future technologies might relate to it? The technologies would be cellular technology, PCS or personal communication services, PDA or personal digital assistants, and low-Earth orbit satellites.

Mark Lonergan: The question was how do these various technologies relate to the Internet — PCS, cellular, low-orbit satellite, and PDAs. Who would like to take a stab at that?

John Patrick: I will. I think it is not really that complex. All the devices that you mentioned will have an IP address and a browser — or whatever we call it fifteen years from now — and they will have the fundamental ability to participate in viewing and accessing information that is available on the Web. And in terms of all the LEOS and cellular and other forms of communications, they will all be mechanisms by which the IP communications will be facilitated. Today there are a lot of ways to be able to connect, and there will be more ways in the future. And I think it's very hard to predict what the growth rates of them individually will be; perhaps Steve will have some thoughts on that.

But from my point of view it really doesn't make a lot of difference. What's important is that we will all have access somehow. And if we live in the jungle somewhere, perhaps satellite will be the most appropriate for us. If we live in this country, I suspect cable modems will become fairly popular. But it really doesn't matter; you will have the bandwidth you need to be able to participate in this phenomenon and all of the devices, from a PDA to a cellular phone, to your car, to a supercomputer and everything in between, will have an address and will be part of this network.

Stephen Levy: As they are to some extent today. I mean, many of us access the network using a cellular phone. When I was preparing this talk I sent out an e-mail to a number of people at BB&N who I think of as forward-thinkers. We have a lot of technologists and are doing a lot of

research on a number of the topics that I mentioned during the course of my talk. And sure enough, as I look down some of the notes that came back, one of my colleagues says “PCS, low-Earth orbit satellites and HDTV will all be combined and used in the Internet.” He describes something about when you’re in a place of business, PCSs will allow local access to nanocells as you move from meeting room to meeting room.

And I think I agree with John, that as long as these things have an address, as long as they have utility, they will be used and they will be connected to the network and they will have a role in the network.

Jay M. Tenenbaum: The one thing I would add to that is that with wireless devices, one difference is that these might not be connected continuously to the network, and that is going to open the way for the kinds of agents that people like General Magic and others talk about, that will basically watch out for your interests on the Net while you’re personally disconnected, and of course contact you, buzz you, when there’s something you do need to pay attention to, according to rules that you yourself set down for those agents.

Mark Lonergan: Question here in the front.

M: I had a question with regards to — we’ve been talking about the future, and our youth is drawn to the Internet. I don’t think we teach COBOL or CICS or IMS in colleges anymore. We run literally hundreds and millions and hundreds of millions of lines of code on legacy systems. If you don’t train your people, they leave. If you do train your people, they leave. The FAA is falling apart because they can’t keep their air traffic control systems running. The Federal Reserve runs on legacy systems most of the financial institutions in the world run on legacy systems, and I can’t keep people interested in working on legacy systems. Can you guys talk to that a little bit? Because we’re talking about the social impact of this whole mood.

Mark Lonergan: So the question is, with all the focus on future issues, how do you keep the old stuff working?

John Patrick: Yes, I think this is a really important point. The solution to this, I think, lies in the ability to combine legacy languages with new-object technology and to be able to encapsulate those modules of code that were written in COBOL or assembler or RPG or whatever, and to be able to encapsulate these modules of code from the past and determine what that module does, put a wrapper around it and incorporate it as an object and enable it to interact with new objects that were created using C++ or Java or visual aids or various things.

This has been the approach that we have been working on, to try to incorporate those legacy modules into an object framework and allow them to be carried forward. Eventually they become irrelevant; but, as we all know, it takes many, many, many years for some of those modules to go away. I think it’s a very excellent point.

Stephen Levy: I was going to say that in working with a number of businesses, to make this transition, you have to have a transition plan. You’re addressing the human element — you know, how do you keep people interested in supporting systems that are viewed by their colleagues as perhaps archaic and not in the mainstream? And I think this gets to the whole question of lifelong learning, and how you keep people trained, how you develop transition plans to go to new technology. Because clearly, if you’re running those systems — and you mention the Federal Reserve; I was on a project at Federal Reserve where we were looking at transitioning to new systems — and if you’re running those systems, they have to be kept

running, but you also have to start thinking about how to take advantage of new systems and entirely new processes, business processes that are now made feasible by new technologies.

We have one customer that's doing two-thirds of their customer service, a very large company doing two-thirds of their customer service over the Internet. Obviously, a few years ago they weren't doing any of their service over the Internet; now they are saving five million dollars a year in labor costs and improving their customer satisfaction. They have had their customer satisfaction independently tested, measured, and they are improving their customer satisfaction by 30%. Now, if their competitor is mired in old systems and doesn't have a transition plan to train the people and to transition those systems, then they're doing a disservice to their employees and their shareholders by not doing that.

Jay M. Tenenbaum: I think I will underscore a point you just made. The question as you posed had, I think, a certain defensive ring to it, and I would like to urge you to think offensively. What the Net opens up for the first time is the possibility of taking these legacy systems, unlocking them and making them available by being able to put them on the Web. The Web is not just Web servers, it's databases and whatever, and you want to put those on the Web in a way that can guarantee the security of the information that is in there. You would like to provide access to those who are authorized to get it, and it might be customers, certain customers or employees or certain suppliers. And that opens up all kinds of new opportunities in the direction of the business processes Steve talked about.

So you can get people who are associated with legacy systems really fired up by this stuff, and that is what I would urge everyone to do.

Mark Lonergan: Looking at the time, it looks like we've got time for a couple or three more questions. Why don't we take one from over here?

M: If the model is conceptually one where ownership is by private and public institutions, the concept of a flat fee in the future goes against other things that you have to charge for a packet that goes on the Internet, because somebody has to maintain it and provide it.

Mark Lonergan: So the question is, how can you afford an Internet when you've got a flat fee structure to pay for it? Anyone want to take a whack at that?

David Garrison: In the short term I think flat fees will be what is required from a customer viewpoint. But I think those flat fees are really going to vary based on usage patterns and perhaps on the size of the pipe, as had been suggested before. I think that there will have to be eventually some sort of settlement process, if in fact there are non-profits that continue to support large pieces of the backbone. If those do not shift to for-profits, or if it's terribly unbalanced, there will be some settlement process, just as we have seen, for example, in the early days of the long-distance business. But I think the flat fees are going to be required to make it acceptable for customers.

Mark Lonergan: There was another hand up here in the corner.

John Patrick: If I could just add one little point to that. I think, on this notion of settlements, that a lot of people are beginning to say maybe we do need settlements. You may be right about this, Dave. I'm not so sure. But I think the Internet is moving much faster than a settlements process could get its act together. The process of settlements is a complex thing to do. Who's

going to figure out how to do it? And by the time people get together and figure out how it's going to work, we will have moved to the next plateau of networking.

Personally, I don't see settlements coming into the picture in the traditional sense. Maybe Steve would have a different view.

Stephen Levy: No, I would agree it is very complex, and what we are really running today is a number of parallel networks allowing one another to pass traffic over each others' networks. So the real beneficiary of a non-settlement approach is the small providers, who are getting a free ride right now.

David Garrison: I would suggest, though, that settlements are a solution if a person or an organization who is providing a major piece of the backbone feels great pain. That's the only reason why the whole settlement process would start. But if they don't provide an irreplaceable piece, then it's not going to happen.

Stephen Levy: Well, clearly this becomes a greater issue as the costs of running the network and the backbone portion of the network increases as we start passing video traffic over the network, and the bandwidth goes up and we need very much larger, more expensive pipes and switches connected to it.

John Patrick: That's really the point Steve just made. People will demand levels of service far beyond what is possible today, multimedia being probably the key driver of this. And this demand that they will have will cause companies like Steve's and mine and others to invest and to develop new technology and build bigger pipes and better pipes and better network management tools and capabilities. And all of these things will be economically viable if people will pay for them. So I think we should be sanguine about the future of this.

Mark Lonergan: Question over here.

M: As businesses, the idea for many years has been to push our products or our information out to users. It's a pushing structure. In the future when everybody is connected, it's more going to turn around and it's going to be a pulling kind of structure, where the user is going to decide what he's looking for. How are we as businesses going to even exist? Or how do we make sure that people, after they're all connected and they don't read our ads in any magazines because there are not going to be any magazines, how are we going to make sure that they know what's going on? How are we going to run a commercial when they can switch channels and go to something that doesn't have a commercial, to make sure that they're not missing the information that's being pushed onto them?

Mark Lonergan: Just to repeat the question for a moment, the question is, how do you maintain the interest of the consumer when the consumer has control over the communications medium?

John Patrick: This is an inversion of the publishing model, right? Today editors and publishers decide what you and I are interested in, when we're interested in it and the degree to which we want to go into the subject matter. That model will invert completely. It already has, just as you posed in your question. This is good for you and me. This is good! Now, businesses just have to be responsive and have to create compelling content and provide value in their Home Pages.

There's 30 million Home Pages out there. Why are they going to come back to your page or my page? Because there's some value there.

Now, if you go into various publications today you'll see what are the most popular pages — the top ten. Why should ten pages be so popular when there's 30 million of them out there? Well, somebody figured out how to create some value there. You go there because you want to download something or because there is a point of view. People will still be interested in a point of view from experts.

So I think there are many ways that content can be differentiated and can be made interesting and compelling, humorous and so on, and people will come back and businesses will distinguish themselves by being very clever at how they do this.

Jay M. Tenenbaum: And don't think for a minute that advertising in the mass media is going to go away. In fact, just the other night I saw, for me, the first national ad on a television network which had a phone number and then a URL underneath it. And it didn't say Internet on it; it just had the thing. And I can imagine someone calling up the telephone operator and saying, "How do I dial this colon slash-slash thing?"

David Garrison: One other comment on advertising. I think that advertising will be very much a part of the Net, but it will be much more sophisticated, much smarter advertising, more in an infomercial vein where the customer will control what information they get and how they get it. I look at television, which we suppose is free in the United States, and if I remember the number correctly, the average American citizen pays about \$128 a year for television for the advertising spent by the people who make the goods that the customer purchases.

Follow me through on that. You see a cable bill, an average cable bill of maybe \$28 or \$29, but the average American is spending about \$128 on TV. And I think you will see some characteristics on the Net where the cost of access and other services will go down and be paid much more by advertising, but in a very different paradigm. We haven't seen advertising on the Net yet the way it will be. It's coming, though.

Mark Lonergan: Why don't we take one more question. Someone else? Here we go.

M: The personal privacy issue. When everything has an IP address and all our devices are connected, how do we guard against unwanted entry?

Mark Lonergan: So the question is, how do you protect confidentiality and privacy in a world where your toaster has an IP address? John, I'll let you start with that.

John Patrick: Well, I think there is a temptation for people to think of security as a problem when really we should think of security as an opportunity. And in fact encryption will, without a doubt, provide a level of privacy far better than what we have today. Far better.

We walk into the hotel down here, the Marriott Long Wharf, and the first thing they say to us is, "How are you going to pay for your bill?" And we hand our credit card to a complete stranger. We call Lands End and we give them our name and address and our credit card and date of expiration, and we think nothing of it.

It's going to be a lot better than that on the Internet. This public key technology is a magical, wonderful thing, and it works. And in spite of what you have read in the paper, nobody has ever broken a full-strength encryption key. They've broken some weak ones that the U.S. government allowed to be exported so they could be sure they could break it; but a real key has never been broken, and keys will only get better in the future.

And so privacy is going to be far, far better. Think, just for a second, about the world of the certified letter. We do this all the time. We put something that is of vital security and sensitivity to us in an envelope, and how do we protect it? We mark it, your eyes only, top secret, to be opened by addressee only. There's a powerful protocol, right? And then what do we do with that envelope? We hand it to somebody in the mailroom. Have you interviewed the people in your mailroom lately? And what does that person do with it? They give it to a person in another mailroom. Well, who actually opens that envelope? We have no idea.

Now, just think for a minute what we're going to have on the Internet. We have it today, right? You have something secret you want to send to another person. You'll get that person's public key from a certificate authority, and you'll be comfortable it's really their key; you'll scramble this letter to that person with their public key and you'll sign it with your private key; you'll put it in a cryptographically sealed envelope and you'll whisk it across the Internet to that person. And when they open it with their private key, you will know that only they could have opened it; they will know that only you could have sent it. You could not have been "spoofed." And when they look at your digital signature, they'll know that it was really you. And another by-product of this is that there's non-repudiation; the person can never say, "I didn't get it." Okay?

So this is security far beyond what we have in the real physical world today, and it is more private. Privacy will be enhanced by the Internet, not to worry. And firewalls work also.

Mark Lonergan: Anyone else?

Well, I tell you, let's call a close to it there. I never expected, in putting this group together, that we could get this much accomplished, and I really appreciate the efforts of the four leaders who have joined us today to get this process started.

I would like to thank the four of you, starting with Marty Tenenbaum, Steve Levy, John Patrick and David Garrison. You folks made this exciting and fun. Thanks.

Also, I would also like to thank Alan Meckler and Nancy Nelson. Alan, of course, is the President and Founder of Mecklermedia, and Nancy is the General Manager in charge of this show. I appreciate the opportunity to present in front of you. It's been terrific.

And finally, and certainly most importantly, I would like to thank you, the members of the audience. By being here, by contributing your questions — and clearly, your passion — you have made this a worthwhile session, and I appreciate your attending.

Thank you for coming and please enjoy the rest of the conference.

ADVERTISING FORUM ON-LINE AND INTERNET COMMERCE — WHERE THE LINES CONVERGE



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Director, Advertising Development, AT&T Interchange

Jay Sandom: Hi, I'm Jay Sandom. I'd like to thank you all for coming here today to talk about what's going on in this exciting new area of interactive communications on-line. Unfortunately, I was not able to hook up in time to go live, but I did can some screens so I will be able to show you some of the things that we've been doing on the Web. Hopefully, by the next speaker, it will be active so you'll actually be able to go live. Given that, however, at the end of the presentation I will invite anybody who would like to come up and give me your card. I'll make sure you get URLs for all the sites we've built in the past and the other commercial on-line services work we've been doing so you can take a look at it yourself at your leisure.

Just to give you a little background on who we are: as you heard, we were founded in 1984 and, indeed, we were the first interactive advertising agency in the business. When we first started, multimedia marketing and multimedia advertising was basically you buy a print spot, you buy a TV spot and that was basically multimedia. Clearly we've gone a long way since then.

Our company is structured in three divisions. One is the multimedia marketing division where we develop strategies on behalf of our clients; usually they're large Fortune 500-type organizations, or we work with a number of different advertising agencies to help them form multimedia and interactive multimedia marketing strategies for their clients. We also serve as a production company in developing actual "inter-ads," or interactive ads, and other multimedia marketing communications applications.

Secondly, we have a computer-based training division, and for some of our work where we're dealing with, for example, direct sales forces, we will create a computer-based training application first and foremost to train that remote sales force in how to sell their new product in the field. Then we'll use a lot of that same digital content and re-purpose it in order to create multimedia marketing applications.

Lastly, we have a title development division, which is a new element in our business where we're actually creating some shrink-wrap products for sale to consumers, with a focus on entertainment-based products.

Just to give you a sense of the kind of clients that we have — which I think is indicative of which industries have now really started to adapt and really embrace these technologies — we first began in a high technology community. One of our first pieces was done for Compaq, for their first Compaq LTE. We came out of the demo disk business originally, but since then we've seen a real broadening of the kinds of clients that are involving themselves with these kinds of technologies, whether it's financial services organizations, automotive, pharmaceutical or, in the last two years, packaged goods.

We have a representative from the Four A's. I don't know how many of you were down a couple of years ago when Ed Artz made his seminal speech about interactive advertising, but in a nutshell Ed Artz, Chairman of P&G said, "If we don't figure out a way of selling some of our packaged goods such as toilet paper and other rather mundane products in an interactive universe, then we're all going to be looking for a job." That was really a rallying cry for a lot of ad agencies to get involved with this business. Many of them — little interactive advertising groups within their organizations — have gone out and acquired independent companies such as ourselves to develop these kinds of technologies on behalf of their clients.

I'd like to show a few case studies, because I think this is indicative of what's available to us. While we're going to be focusing today on the on-line universe, I'd just like to point out that we work and have worked in a number of other digital channels as well, including disk-based which was the original delivery channel back ten years ago in sending diskettes via direct mail to customers.

First example: one of our first clients is Citibank, and we've been promoting some of their financial services using diskettes as an electronic brochure. We also do a lot of work in CD-ROMs, whether that is a dedicated CD-ROM for one particular advertiser — for example, right now we're working on a CD-ROM for Pontiac to showcase all of their cars — or whether it's working with the "digizines" that are out there today and growing by leaps and bounds.

[With] the CD-ROM-based magazines we will create interactive advertising to insert in those digizines as well. We also work in the kiosk area in developing point-of-information and point-of-purchase kiosks for trade shows and retail outlets, corporate high-traffic areas.

Lastly, as you sort of look at broadening the bandwidth all the way up to interactive television, we've been working with a number of the different ITV providers that are in test today and consulting with them on how to develop their models — not only the technologies, but really what is the taxonomy of their service, what is the pricing model, etc.

Today, however, we're focusing more exclusively on the on-line services and the Internet, so I'd like to sort of walk through those since we only have a few minutes here today. Three examples of clients we have worked with in the past are Hyatt Hotels, Australia for Australia tourism and the American Plastics Council, which is a site we recently completed on the Web.

In the case of Hyatt, and in speaking about the commercial on-line services versus the WorldWide Web, we believe that if you're in the advertising community you can select radio, print, a number of magazines, a number of radio stations or a number of TV shows in which to place your advertising content. We believe you're really doing your clients a disservice if you focus exclusively on the Web. That has become the kind of "flavor du jour," as ITV was a couple of years ago, and we believe it's very important for clients to look at the full panoply of digital channels out there, not just on-line but within that on-line universe, [with] the commercial on-line services that in many cases have a much more established audience and much better demographic profile of information about the targets you're trying to reach.

In this particular case of Hyatt Hotels we were looking to target mostly for business travelers. Again, a business-to-business application. We targeted business travelers who traveled internationally with the information they needed in order to promote Hyatt Hotels.

We wanted to give them the ability to speak directly to Hyatt, and to collect data about travelers and their travel habits. As you may know, for reasons of privacy the commercial on-line services will not provide you with individual names unless the individual who is accessing their on-line service volunteers this information, but they do provide a lot of information in the aggregate form which can be very helpful to us.

In this particular case, our solution was to build a store in the electronic mall. We have three million members worldwide on CompuServe, and 30% of them are overseas. Our clients

obviously have a lot of properties overseas, so rather than AOL or Prodigy or some of these other commercial on-line services, we chose CompuServe for their large percentage of business users. We developed a store that had the ability for the user to visit Hyatts worldwide, to access their worldwide guide and to join their "Go Passport" program, which is their frequent-stayer program.

We also developed a search engine that helped them to access properties based on a number of attributes; so if they were looking for a golf course in Southern France so the chairman could play golf during his convention, you would be able to put in those attributes and come up with a property that you wanted — a virtual concierge that allows travelers to speak directly to Hyatt and offers the ability to book directly for reservations. This is what CompuServe looks like, and you can see that we were able to place this Hyatt Hotel right next to Easysaver, which is one of the most highly accessed areas on CompuServe. You can see on the right that you can do a number of things with this site — you go and look at the resorts, join the Passport Club, get specials, exclusive CompuServe packages and a number of other things.

One of the search engines that we developed for people going in to look at properties included a feature where you could select a property based on physical challenges or art and culture. If you're looking for water sports, for golf or tennis or any number of various other attributes, you could select those to pick the property.

In this particular case, [for this demonstration on the screen right now], we were looking for fly fishing in Argentina. We have some specifications on the hotel, and you can download a picture file to look at the property itself.

The results of this campaign in September/October period [were that] we had 65,000 hits at this site — and these are actual members going in, not just the same guy accessing it several times. We were able to sign up 1,000 Go Passport applications. We had 700 other people order brochures, 600 special rate requests and over 300 miscellaneous inquiries. So this proved to be a very successful campaign on CompuServe because it was very targeted. We looked at the kinds of application needs this particular business traveler wanted, and we were able to deliver it via the technology that CompuServe provides.

We move on now to a different challenge, which was a consumer campaign targeting individuals. In essence, Australia was a client that [hired us] to enhance awareness of Australia as a premium travel destination. We also wanted to showcase the texts and photos, the top tourist destinations, to provide Australia files with the means to communicate with one another and build a community.

You all may know that one of the major reasons that people go on-line with the commercial on-line services like AOL, as well as the Web — 50% of the members say that the top reason is to chat, to talk with one another in this virtual community that various cultures create, so that was one thing that we wanted to provide. We also wanted to deliver on-line conferences with Australian celebrities and to highlight special tours.

Our solution in this case was not CompuServe but America Online, the fastest growing of the commercial on-line services and [the one with] the largest membership base domestically. They have a rather large and expensive — you may have seen this package slammed in the media in the past, the \$240,000 media buy for AOL to develop a full domain. Ours is one of the few dissenting voices. In looking at that particular offer, we felt that if you look at the content and the amount of content you could get for that media buy. we felt compared to Prodigy, for example, and that it was actually a very good deal.

So that's one way you can go at it. The other way, of course, is to negotiate with a content provider or an editorial entity on AOL. We chose a third route in this particular case; we negotiated directly with "Travelers Corner," which posts the travel section on AOL and will

soon be hosting a travel section on a number of other services. It does right now on *Pathfinder*, for example, on the Web. This was a less expensive route and also provided us with the same kind of content capabilities that we wanted to exploit. We offered a free sweepstakes for people to travel to Australia.

We partnered with one of the prime Australian tour operators to offer specific packages and we negotiated, I'm happy to say, with a number of Australian celebrities, including Elle McPherson who will be going on live next month. So if you want to go on-line with Elle McPherson you can find out about the hot spot in Sidney, or the best nude beach and whatever it is you're interested in.

This is what it looks like on AOL; [it's] considerably more colorful than CompuServe. Since it is a consumer-based service, you can communicate with a number of different individuals as well as Australia [and get] a variety of travel tips based on what it is you want to do when you're over there. It offers you information on special tours, the contests, and enables you to actually sign up and win a free trip to Australia if you're lucky. We've developed a number of utilities that you could access live or download so you wouldn't have to suffer the on-line charges here in order to build your own itinerary if you're traveling anywhere in the world, and not just to Australia.

You could go in and get information about Australia, as well as picture files. If you're interested in Tasmania — or trout fishing, since I seem to be obsessed with trout fishing these days — you could go and find out about Tasmania and what was available there.

The results in this particular case: we had over 16,000 entries in the sweepstakes in the first two weeks of going live. In the first month we had 55,000 members going into the virtual Australia domain; 25,000 images were downloaded; and in that time 500 utilities were downloaded.

Because of the high traffic we generated at this particular site, AOL placed us on their "Banner Page" three times in the first month. This was a real coup. As you know, it's one thing to have a great site — whether it's a commercial on-line service or the Web — but it's another thing to drive traffic into that site. So negotiating these kinds of promotional deals with these providers is very important to developing what we call "cybersignage" in driving traffic into the site.

Talking about the Web, we believe that cybersignage is really critical. The commercial on-line service already has built-in constituencies; clearly the Web is a different animal all together. It's like having a party — you can have the best caterer, the best bartender, the best band, but if nobody knows about it, who cares? So driving traffic in there is really key.

In developing a site we look at a number of different vehicles in promoting the site and driving in traffic.

Starting from the top and working clockwise, we often negotiate with sympathetic WorldWide Web corporate domains and ask them to develop a link so that if traffic goes to their site they can bounce directly from their site into our site. These days, sometimes you have to pay, sometimes you don't. It's still early enough in the game where very often reciprocity works — you know, "we'll give you a link to ours if you give us a link to yours." Another thing would be sympathetic editorial contents on the Web where you would be able to buy, for example, a space in one of the editorial providers there.

Time Warner would have you on *Pathfinder* on the Web, and develop a link directly into your Web site. Passive media, TV print, radio ads, business cards, any number of different vehicles or passive vehicles where you can promote your URL or your address on the Web should not be overlooked; and, of course, [you should look at] the on-line services, the commercial on-line services. Not only do they provide an established constituency base, but these days they also have very robust browser links, some more than others. But they all have

browser links from the commercial on-line service, so if you bring them into your site on Prodigy, CompuServe, MSN or any of these other services like AT&T Interchange, you will be able to jump directly from there into your Web site.

Lastly, let's not overlook sympathetic "digizines," [which are], again, CD-ROM-based magazines where you can develop a little button on the screen, and if that has a modem you simply click on it and it automatically dials the phone and brings them into your Web site. So these are all different ways that you can leverage these other constituency bases and actually move them into your Web site.

I'd like to talk a little bit about this last case study, which is the American Plastics Council. We've done a number of Web sites for Pontiac, for Cadillac and Kraft and a number of others, but this is one of our more recent ones and it exploits something which we're very proud of and something which is very unique on the Internet today. Our challenge in this particular case was to develop a site for the American Plastics Council targeting a variety of constituencies which are very key: academic students, industry members and others. Our solution was to annex that site on our server. In some cases our clients have their own server, but very often we encourage them to lease some space on our server. We exploited something which we call "Charlie," which stands for "Customized HTML and Real Prime Link Integration Engine." That's why we call it Charlie — it's a lot simpler.

We also wanted to position the site as the definitive location to find information about plastics in the environment, and we wanted to propagate the site with a lot of archive articles and other information about plastics in the environment. Finally, we negotiated on behalf of ABC with a number of very sympathetic sites for cybersignage to make sure that people would know where we were so they could come in.

I'll talk just a moment about Charlie here before I close. One of the biggest problems on the Web — as we've seen it on working on the Web for the last year or so — that's two years, really — has been that if you go in as individuals to any given Web site, to a Home Page. Generally speaking, unlike other digital delivery like discs and CD-ROMs and kiosks, which are robust enough to personalize themselves based on individual accesses and based on the needs of that individual looking at that particular site, the problem has been in the past that you go into a Home Page, it's the same Home Page for everybody; and that does not live up to the promise of interactivity, which is really the power of one-to-one relationship marketing and what this is all about.

So for the last year and a half we've been putting together and working in units to develop a database engine which we call "Charlie," which sits behind any given Home Page and provides you with benefits. It allows you to capture data about each user to detail profiles; that is, when somebody comes into a Web site, they're not forced, but we ask them to give us a password so that we can identify them as an individual, and that enables us to track every keystroke they do with our disk-based, CD ROM-based and kiosk-based applications. We know how many modules they go into, which modules they look at and how long they spend in those modules, [and we do this] for accountability sake so we can learn and improve our site over time. It gives us a very clear picture of each individual that enters the site because every time that individual goes in it enhances the personality profile that is unique to that individual.

In the case of Pontiac, for example, we had one guy going in, and he likes red sports cars with convertible tops and wind in his hair and what have you. The next person may like a large kind of car with elegant features and really doesn't care about the engine that much, but cares more about the rich Corinthian leather and the sound system. We need to know that if we're going to target these individuals effectively, so tracking where they go within these sites is very important. Once we know that it also allows us to build that personality profile, to pro-actively market new products and services and information with e-mail to those individuals.

One of the problems with any Web site today, or most Web sites today, is that when you go in, even if you can track an individual who's accessing your site... The Web site is really a nexus, a collection of other links to other places, and the best sites really have the most links in many cases. So somebody goes into your Web site; when they branch off to another Web site, you generally lose them. That's been a real problem in tracking and figuring out what they care about.

With Charlie, what we've been able to do, in essence, is that rather than branching out of our Web sites when they go and access other information, it literally brings in those external HTML pages so you don't lose that individual. It actually draws them into your site so you can't lose that tracking capability. In that way it helps you learn about a user's Web habits and their information requirements, which is very important in enhancing our database of information about each individual user. It also enables us to maintain connections with each user for longer periods of time.

Finally, perhaps the most exciting capability of Charlie is that it actually is robust enough to create HTML pages on the fly in real-time, based on these user profiles. So back to my car analogy; if you're an individual who likes sporty red cars that are convertibles and your wife happens to like boxy town cars with the rich Corinthian leather, when they go once into any given automotive site that we've developed we know what they like. You don't go into the Pontiac Home Page, you go into that individual's Home Pages that happens to be sponsored by Pontiac.

So the guy who likes a sporty red car, he sees the file with the sporty red car. He sees the power options on that first menu that comes up, whereas his spouse will see an elegant town car and all the information that she needs to know and wants to know about the interior, the sound system, the accouterments of the car. Again, [that's] living up to the promise of interactivity, making it truly personalized. The more relevant it is, the further up the sales curve you are and the faster you're going to sell your products.

The last thing it does [is that] it allows you to speed navigation to the site. One of the problems has been access time with a Web site, so if you can go directly to the information about a consumer you don't have to sit there wading through page after page that you don't give a damn about. You want to get right to the meat of the matter, and this is something Charlie provides.

In closing, I just want to give you a sense of what it looks like very quickly. You would go in here, enter your password and your name. You would then go in and be able to choose which constituency group you are, if you're an academic, an industry allied association member, a media person, what have you. If you're an academic, you'd come in here. You then would be able to select what kind of teacher you are: a graduate school teacher, high school, what have you. Then you'd be able to go in and look at the information that is relevant to you.

You do that once; the next time you come in you go right to this section and you go right to the area you care about. You can always go back to that Home Page and look at other areas for the media, for the government, for other constituencies if you wish; you're not forced to stay here. But the idea is to make it as personalized as possible. There's sort of a mall there.

Anyway, in closing, this is the multimedia pyramid. We talked a little bit about the on-line universe today; I'd just like to add one final thing before I get off and that is, in essence, that whenever you develop content for your clients or for yourselves, whether it's on-line for the commercial on-line services or on the Web, make sure that you design your content in such a way that you can leverage it across the multimedia pyramid. So those building blocks are really applicable; this provides you with real cost savings and uniformity when you develop all of your content, and makes sure that you get the message across effectively for your clients.

Thanks very much.

Andrew Jaffe: That was a good warm up. At the end we'll have [inaudible], or after the presentation or at the very end of our presentation for you to try and get on the Internet and show us one or two of these sites.

Leslie Laredo is Director of Advertising Sales & Development for AT&T New Media Services here in Cambridge. This was a company that was originally Ziff Davis Interactive, where she performed similar functions before it was bought by AT&T in December of 1994. Before that she spent six years at Prodigy, and before that she was one of those pioneers in Videotext, which I assume is only about ten years ago, but sounds like when I was little. I remember myself when Videotext came along, and Knight-Ridder lost seventy million dollars in it. At any rate, here we are in the present getting ready for the future. Leslie, tell us something about AT&T's new video services and how you view the Web.

Leslie Laredo: Thanks. Actually, I sold my first Videotext ad in 1981 and sometimes I get introduced as the oldest living interactive ad sales rep. Thank you for not saying that.

Andrew had asked me to give a little perspective of the world as I see it — since I've been around way too long and wish I was old enough to retire, but I'm not — and then I'll go on to show the new service that AT&T New Media Services is launching. In fact, it's available effective today, so we're very excited about that. I'll actually do a live demo, since the phones seem to be working.

Just a short perspective on the last twelve months. A year ago I was going around with presentations at various forums; I think I did Internet World last year also, and I thought things were pretty fast and furious. In the last twelve months it's been like warp speed, and I say this and a lot of people nod usually and say, "God, it's the same thing for me." I've had four jobs, two companies, four different divisions and four sets of business cards in the last twelve months. It's been pretty amazing.

I went through working for Ziff-Davis Interactive and got with AT&T — [which] changed from Interchange, owned by Network Company New Media Services — and then recently we got split into three companies. Every time I get a new business card I'm sure we're going to get a reorganization. It's been fascinating in that perspective, but it's also been just this warp-speed view of the world. When I talk about my job now I say, "God it's great, it's cool, it's thrilling," then it's scary, it's daunting because there's so much change and it's hard to keep up on it.

We get some news services fed into our server to get news bites. In the last six months there's probably thousands and thousands of articles just on our business in there, and to read them all every day is impossible. The worst part is that I'll say something today, and I hate being recorded now because what I say today sounds stupid tomorrow. I gave an interview for Jupiter in one of their magazines or their newspapers a few months ago; I was interviewed in June and it appeared in August and I read this interview that I had given and I went, "God, I sound so dumb." It doesn't make sense any more. It's very frustrating. So now I ask everybody to say exactly when they took the interview, because that counts a lot.

But the most interesting things for me... A year ago I was sort of dismissing the Web as sort of marginally important. I've changed my mind dramatically. It is the most staggering event; I call it the "mega-event." It's now not only merged, but it's accepted as a form of marketing communication for most large and small companies. It's been driven by the rapid advancement of a technology that I'm sure all of you are deeply involved in: the impressive growth rates that are going on in the on-line services.

A year ago there were about five million on-line subscriptions to commercial services. The last I heard was eight million, possibly 9.2 million by the end of this year. That's just

amazing to me. I was around when there were tens of thousands, and it's just [getting] exhaustive coverage; every day in every major trade, every major general consumer magazine and newspaper there's coverage of our industry. My mother started a little clipping service, and she sends me things that she finds in her neck of the woods.

Then [there are the] deals and deals and more deals and, of course, all the hype. Every company in this thing in a big way loves to generate PR, whether it means something or not. So I thought I would go through a list of things that have happened just because I think it gives some sense of how hard it is to stay on top and make really important decisions when everything changes. Personally, starting a year ago, Ziff got sold to AT&T and Ziff got sold again, or is in the process of being sold again.

AT&T bought Interchange. Microsoft announced its plan to acquire into it and, of course, that didn't go through. MCI invested two million dollars in the News Corp. Delphi Service. IBM announced it's buying Lotus, and Disney and Cap Cities plan to merge. Time Warner and Turner Network are merging, and AT&T announced that it's moving up. There's probably a few more other mega-ones in there; I just didn't get to all of them, but if you think about one industry in that length of time — all of these things have huge impacts on us and these mergers will, as the year goes by, start to become something as products and services come out of them. I actually thought about giving five or six lists like this, but I thought that would get kind of boring and I don't like being boring any more. I've been doing this too long, so I decided to do it the Jeopardy way.

I actually got on the Web last night. I was trying to download the theme song for Jeopardy, and the only thing on the Web was Alex Trebek talking so I couldn't get the theme song. I'm sorry. This is sort of a flat presentation, but please answer your answers in the form of a question.

The first question is: who in June of 1995 inaugurated the first WorldWide Web server giving the public access to the Federal Government? Answers? The answer is, "Who's Newt Gingrich?" No one got that one? All right, let's try another one.

How about, "he holds the first Senate Internet Porn Hearings." And the question is, "Who is Exon."

You have to keep on it. This is very important to us, but he was way ahead of Senator Exon in addressing porn in the Senate — you had the answer — "Who was Bob Packwood?" That's not an industry one, but okay.

The government agency that Steve Pace hates. "What is the Justice Department?"

The event in August of this year that turned tens of thousands of AT&T managers into lobbyists? "What is the 'T Nations' Bill?" All right, very good.

The on-line service that introduced the first Web browser. All right, good, all right, I should have put up dollar signs, that would have got you going. I'm not competitive.

The new on-line services that gets members to pay for beta when it's mostly under construction — I want [Steve Goldberg] to answer that question. Thanks, Steve, I told you I'd get you one.

There's someone here from Microsoft — I told you I'd get you on one of these. I like this one. "The on-line service that provides every adult in the free world with ten free discs a month."

"He was rumored to be buying the Vatican this year."

"This company's rumored to be buying Sears' stake in Prodigy." You know who that is? You didn't hear that rumor? That was CompuServe. You've got to read these news bytes more.

The last question here, worth \$100. "What's the company that launched the first comprehensive business-to-business on-line service?" Andrew gets \$100.

That's just an idea of all that's going on; I mean, there's just so much, and it all impacts what we're doing. Last year I was actually looking at some presentations I did. We were thrilled at five million subscribers to on-line, this year eight, and as I already reported early on, now it's like nine million.

Last year CompuServe was the largest service; this year AOL has taken the prize. Last year I didn't even talk about the number of commercial Web sites. I knew it was sort of important, but personally I was more concerned about what was going on with the commercial on-line services. This year I'm trying to find the numbers, and the last I saw was 400,000 commercial sites as of January 2, 1995. I don't know what it is now. I don't know if anyone here knows, but it's growing at a rate of 300 a day or something. Amazing.

Last year I knew of no ad agencies with Web sites. This year we can show you dozens and dozens of agencies that are on the Web. These are not just new agencies, and there are ones that have been doing it for a long time, like Jay's agency. It's the O&M, and the major guys. Last year there were no agency of record assignments for interactive; if you're in the media world you know that's an important assignment to get to control the media buying for the agency, the interactive. Again, this year there's been dozens of assignments.

AT&T has given our assignments for AOL and interactive to Modem Media, for example. Last year, minimal research was going on the Web; this past year there's been numerous studies released, mainly from university sites. I saw recently a study of responses. American Internet Study, which is going on right now, just concluded their first wave; it's amazing, because they're now getting some real interesting data in how on-line and the Web are influencing the consumption of traditional media. I think that's a big deal in our business.

So what else is changing? Studies are showing that audiences are becoming mainstream; not mainstream enough for me, but it's not 80-90% male. Some research is showing 60-70% male, which means more women are getting on the Web and getting on-line. [In the] last study I saw that forty million people were on the Internet. I'm really concerned about what's going on in the U.S., and the last study I saw that ten million American have access to the Internet and about 40% of those were through commercial on-line services.

On media consumption, this is the finest number: 54% of on-line households spend less time watching TV, and 16% actually spent less time reading newspapers.

The other thing that's changing is the business model. I know it's changing because Interchange has changed its number in the last year. It's changing, but on the Web you're seeing registration versus no registration. *Hot Wired* registration is required now. *Pathfinder* didn't register, now it does — and you're seeing this going on throughout the industry. The main reason for registration is advertisers want to know who's getting there, and the only way you're going to get it is registration.

But the big thing that is definitely coming out again in advertising is the funding source for what goes on the WorldWide Web, and [the fact] that the on-line services say they need more to keep their costs down and make it more economical for users to spend more time and hours.

The other thing that's changed is access and browsers. A year ago we heard about the access providers to the Internet; now we're hearing the access coming from the commercial on-line services. We're hearing a lot about new browsers, about *HotJava* and *Netscape 2.0*, and this is changing. The funny thing is that people are talking about all these browsers coming down; well, it's still this issue of commonality and oneness where if I have the *Netscape 1.0* and I don't happen to get the new one, I'm not going to read it and see sites that are created. I don't know if everybody's thinking about that, but it is going to impact how the world is going to view what you're doing on the Web.

So what does it mean to me personally? Well, if I'm speaking of the advertising media buying creative sales organizations out there, your clients are demanding that you participate. They want you to justify the results. Now, that's hard to do because of the problems with measurements. Agencies are having a hard time finding and hiring, training, and staffing the people they need to create, plan and manage all of these interactive projects. And I know, because I get calls all the time from headhunters who ask me if I know anybody. My Rolodex is great, but it's not that good. There are no standard tools and measurements. There are no less than nine — and now Charlie makes ten and counting — different auditing products out there.

There are probably a lot more than I know about, everything from I-Pro — which is becoming sort of the standard — to WebTrack to Digital Planet. There's a whole bunch out there that are all trying to become the standard in how media gets measured and reported on. Probably the worse part is that we're all being forced to make decisions so rapidly with very little data; I'm being asked to come up with rate cards and pricing and all sorts of things. For what we're doing we don't have usage data yet, but we've got to make these decisions because the world is changing around us and we can't sit around and wait for the data to come in.

So, the implications are huge for advertising, especially on the Web. There are different pricing scenarios, and it is really tough for agencies to decide how they're going to buy your site versus another site, [whether to] put a banner or button somewhere or be involved in more in-depth content. You're seeing that Prodigy, I think, is still doing CPM; maybe not. I haven't been there in a while, so I'm not quite sure what they're doing.

You see guaranteed impressions on a lot of WorldWide Web sites. They're saying "We'll promise X thousands or millions of impressions in a certain time period." I heard this is no longer going on, but Individual, Inc. started this auction: you decide what your Web play, or what the link is worth, and then you pay for it. The highest bidder pays the second highest price. When I heard that, I kind of laughed and said, "Gee, if they don't know what their site is worth, who else does?" How could we know?

[There are] lots of sales commission deals. You go into the Internet Mall branch on some of the stores on Prodigy, CompuServe, and I'm sure they are all paying based on percentage of sales. And a lot of what's going on now I call "merchandise positions."

A lot of Web sites are major publishing sites that are coming out of the major print in broadcast companies who are just packaging it all together. "Buy an extra spot, we'll throw in an interactive. Buy an extra page and we'll throw in our interactive." I personally think that's really bad, and I applaud one of the few companies that I know is not doing that — CMP, which is selling off the rate card and not merchandising, and packaging interactive with the rest for media products. I think the only way it's going to stand on its own and have its own value is to not have its own rate card packaged in.

Back to the audience issues. I can't stress this enough; it's exciting to hear what Jay's doing with his Charlie database. But there's also the issues about collecting data and privacy and how it's used. A lot of people are using data, and I heard of an ad — I think it was *Penthouse* that was doing some kind of promotion about why you should put an ad in *Penthouse* versus *Playboy*, because they had more hits. They're only interested in the number of hits. You've heard the discussion; is it a hit? Is it a visit, is it a session, is it the same user? How do we know which one? How do we compare? There's nothing standard across almost any site.

I could put a spreadsheet up here and show you what the top sites are doing. Every single one is different; there isn't one set of commonalities amongst them. There's no category of standards, whether it's all Internet-sized or whether it's all commercial on-line services. There's nothing standard, so it's a daunting exercise for media people to say, "Where should we spend our dollars?"

On the other hand, I do think that media buyers and companies are doing this on their own without their agencies. They need to be where the “cybermasses” are, and they need to be on the hot Web sites. They need to be on the commercial on-line service, because that’s where the people are if they want to get noticed. Jay made that point earlier.

You have a great Web site, but what if nobody came? And with 400,000 commercial Web sites there has to be a lot of intense effort to get your site noticed, and that means not just *Yahoo* and *Netscape*; [it means] finding context, finding the right place for your banners and buttons to go and more. Right now the majority of new media budgets are being spent on the creative [aspect].

Million dollar Web sites are being created. I read an article the other day where *Organic* was quoting that their average Web site costs about \$30,000, and now they’re saying their average Web sites are costing hundreds of thousands of dollars to create. Companies are spending more on creative, and not on placement and getting their URL on their packaging, on their ads and in their brochures on other places. That hundred thousand or million dollar investment is basically meaningless.

[I want to talk about] the availability of audited statements. You’ve seen alliances going on; ABC, [Audit] Bureau Circulation is — I think it’s either with I-Pro or WebTrack or Nielsen — is forming a team with the other one, and you’re seeing all these people from the traditional media world trying to form alliances with the new media measurement companies so they can go out there and say that they have something that does this. This still is nothing today.

The great debate, a lot of discussion, [is about] “Should we be on-line. Should we be on the Web? We know on-lines die, commercial on-lines die, just all be on the Web.” I hear this and I hear this, and granted I do have every perspective, but I do think that it’s not “either/or” and it won’t be for a long time. I really think there’s much more power. We think about integrating proprietary on-line service with the WorldWide Web present.

Commercial on-line services give you market access. In the case of AT&T, we have ninety million customers to whom we can market. That’s terrific market access. You don’t have that with Web sites. They said we’ll have market access if they can get their product working better with their Windows 95 product out there. On-line services can offer much more defined audiences.

Prodigy has great media. They’ve really spent a lot of time defining their audiences by doing audience studies, because they know who is signing up across the commercial services. On-line services tend to do a much better job tracking and providing research on who’s there. Some on-line services do better, some do worse, in terms of presentation and tools. I won’t argue that the tools from the commercial services are great, but I would argue to take a look at the AT&T Interchange tools because they think they’re better than all of them.

You can promote extensively on the Web and commercial services. I think you need to think about that in both places all the time. I was personally involved with some accounts when I was at Prodigy that did some heavy duty promotions of their Prodigy sites on Prodigy. Coors did a promotion in the NFL area and had terrific response; some of the car companies did too. So I think that promotion works if it’s done right.

Last of all, context, context, context. This is what’s it all about. You’ve got to be where people are going to want to go. A banner with your logo on it is meaningless to a reader unless you’re branding something to them in the areas that they’re in. If I’m reading a printer review section in one of the PC computing services, I’m more likely to hit on that versus if I hit a different kind of art. I think looking for context for your product and your company is incredibly important.

There’s a lot to get done, and sometimes I think, “God how are we going to get this done?” Every time I think they can’t be done I think, “Well, here’s some quotes, you know.” I

like going back not that many years when someone from IBM was saying, “What good is a microchip? Who would want a computer in their home?”

In 1977, I was in college and Bill Gates was saying that 640 ought to be enough. And my favorite one actually is this one, which is, “Who the hell wants to hear an actress talk?” I sometimes open my presentations with a little blip from the *Singing in the Rain* video. There’s a little segment in there which actually showed the first time a talky movie is on and people in the audience are accusing the producer of having actors behind the screen who are really doing the talking.

Now for the commercial that I’ve been allowed to do, a quick commercial. AT&T Business Network is commercially available today and you can get over to the World Trade Center or wherever it is, where it’s a mess. Go over there and check our booth. I won’t say anything bad about Meckler because, as I said earlier, “How can they mess up?” It’s such a great conference and they can’t get people registered in the door. Wasn’t it at Internet World in San Francisco six months ago where people were waiting two and a half hours in line to get in? Anyway, they’ll get better. It’s a good show.

AT&T Business Network is an indispensable resource for managers and professionals who need up-to-the-minute news, business and financial news, for activity software packaged in toolkits to help them do their jobs better, for depth references and research databases. It does also offer a communications network so professionals can talk to others in their industry and in their profession.

We are totally integrated with the Internet. The most important thing is that it is an Internet-based publishing platform. We are the only service that built-in the TCP/IP protocols, which gives us seamless integration to the Web, and I’ll show you that. You can access Interchange from the Web, so you can dial in through phone or dial or access through the Internet.

I’ll give you a demo real quick because it’s going to be hard to see over the content providers. We have about [inaudible] signed content providers, and that number’s growing every week. Probably the most important on the list is CNN. We just cut this deal; it’s a multi-year, multimillion dollar deal. We’re seen as a major news source to the AT&T Business Network and we’re also getting about sixty spots a day on CNN, beginning in about two weeks, for them to promote. So every time there’s a news item, get more on CNN News on-line and go to AT&T — there’s a business network. So that’s very exciting for us. Here’s some more featured brands.

These are some of the ones that are up there now. I’m going to get right on-line; I am still connected. We’re at Interchange on-line. 14.4 access. I’m going to tell you this so you see how fast it’s moving. This is the Interchange Central News Service. It’s a news, business, sports, weather — we created an area where if you’re on-line for business information or some of these other targeted vertical publishing areas you wouldn’t have to sign off and go somewhere else if you wanted to find out who won the World Series.

I’m going to download a highlight screen. We do multi-task, and since that takes a little bit of time to download, I’m actually going to go back to it and I’ll pop up to News. Here’s the news section, and you’ve seen it come down. Now I’ll go back to sports, and here it is on-line. So in background mode we were seeing some stuff come down the line where you’re seeing some foreground.

M: What is this site called?

Leslie Laredo: This is not a site, this is a proprietary on-line service developed originally by Ziff-Davis Interactive and now owned by AT&T in the New Media Services Group. It's different. We have different publishers on-line.

Ziff-Davis has whole publishing areas on Interchange. The *Washington Post* does, too, and what's good about these businesses for these companies is that they can actually manage not only their own info space, but they also own their customers. They do the marketing, circulation, retention of their customers and they also sell their advertising. Here's the Business Network.

I'm being given a time watch here. Here's the News section, and we have featured brands down the left and then editors pulling out areas on the right. I want to just point out that AT&T does not create any news; We are actually an aggregator and our editors are really information managers.

Here's the automotive, and I'm going to go into News on how we integrate the Web. Now, you don't see a lot of Web globes right up front because we're still dealing with our users using old versions of software. We just released our new version of software that has a *Netscape Navigator* to 1.2, and that's why some of these are a little bit hidden at this point until we get everybody upgraded on the new list of software.

So I clicked on the globe. Depending on who the site is with, we'll see how fast it comes up. It looks like it's pretty fast. There, you've seen 14.4 access to this site on the Web, and this is Ergo Web. I've not been here before, so I'm not sure how long it will take, but you've seen the seamless integration of *Netscape Navigator*. Not too bad at 14.4, and you can go back and forth.

We're having editors integrate Web content into the Interchange content. Are you really going to kick me off the stage now, Andrew? All right.

Andrew Jaffe: The commercial that took too long.

Leslie Laredo: I'll be around afterward if you have a questions. You can go by the AT&T booth at the Exhibit Hall and see the demo of the service working. Thank you.

Andrew Jaffe: That was great, Leslie. Next time I want to play Jeopardy, I want to know your world view and I want to see you supplied with the Web more. I think you could have had more on the Web and your view of it. That was a wonderful overview and really a lot of data.

While she's getting unhooked and Andrew Nibley is coming up here, I'd like to call attention to *Internet World Magazine*. The November issue has an article on the Internet's phenomenal growth mirrored in startling statistics. I don't know whether these statistics are worth much, but we're coming to feel that in the U.S. there are about thirty million people with access to the Web, about three million of those are in households that are connected. Most of them are connected from their workplace, so it's hard to know at their workplace how many people are actually using the Web. Yes?

M: [Inaudible] e-mail access versus real access to the WorldWide Web?

Andrew Jaffe: A good point. I'll let you read the article and judge the statistics here for yourself. I'm not going to get into them, but obviously a lot of that is e-mail, and either your company is claiming that it's on the Web but you can't get into the Web at your desktop, or your hooked up to an on-line service but you can't really download the browser and you're being counted. So there's a lot of space in the numbers.

I think what is interesting, and we'll get back to it in our question period, is the whole question of what are we counting? Are we just counting hits, are we counting your access or are we counting your actual involvement?

With that little transition... You're going to work from your seat there? Good. Andrew Nibley, like myself, is a real editor, a real journalist not trained in the art of business. He's learning it sort of seat of the pants. He's Editor and Executive President of Reuters New Media, which was formed two years ago to create new products for the consumer and corporate markets. They have now a suite of business information products, a suite of on-line products, an Internet news product, and a suite of products now they're developing just for the advertising industry which includes Ad Value, a transactional system and Aim 20 for creative end, and they're planning even more products just for the advertising industry.

Andrew was editor for North American Latin America, for news and television, and before that he was Reuters' news editor for Europe. He's had fifteen years at Reuters, and he's now having a lot of fun exploring this new way of communication. Andrew, I'd like your view as somebody who is actually creating content and trying to decide how to deliver it to users.

Andrew Nibley: Good morning. Normally, when I see a crowd this size I have an overwhelming urge to break into a rendition of "Feelings," but my four-year old has given me the plague today so I'm loaded up with various drugs. I would appreciate it if you would attribute my remarks to me and not to my poor company and employees there.

Andrew was kind enough to tell you what my official title is. This is actually what I'm known as in the shop, largely because the people who work for me are half my age and twice as bright as far as I can tell. As Andrew said, I'm going to give you the perspective from the content provider's point of view. The same four-year old who gave me the plague this weekend strolled up to my bed as I was waking up from my third trip to London in a week and a half, and as only four year-olds can he got one inch from my nose and he said, "Dad?" I said, "Yes, son?" And he said, "For the first time in my life, things are finally going right." I feel the same way, son.

It's a good time to be a content provider. Frankly, I don't care whether the commercial on-lines win. I think they're both going to win, actually; they both need content, so that makes it a pretty good place to be right now.

A little bit about Reuters. Reuters has been a content provider for 150 years, and I think it makes it the oldest news agency in the world. We've actually been in the on-line business for the past 40 years, primarily in the foreign exchange industry.

When I joined Reuters I think we made about four million a year. We're now a five billion dollar company, so the short answer is, "Yes, you can make money in the on-line business." We paint with all the colors in the multimedia rainbow. We own the world's largest television news agency; we have 138 bureaus around the world, which is more than anybody else; we have relationships with over 200 exchanges so we have financial news and data; and we also have global photo operation and a global graphics and audio operation.

When we formed New Media two years ago, we weren't exactly sure what new media was. Interactive television seemed terribly popular at the time, but after one year in the business we broke it down primarily into main business groups: business information, on-line publishing and corporate television. The yellow groups are the ones that are 100% controlled by Reuters, and the white groups advertise education and entertainment.

We have business ventures there with other partners. In advertising we have 50% ownership in a company called Ad Value with Group W. We have education venture with TCI and an entertainment venture with [Riddell]. Andrew mentioned that we have some product offering primarily for advertisers; Ad Value is a transactional system that allows you to buy and sell national spot television time. It's a transparent system that allows the ad agencies, the reps

and the television stations to see the process all the way from start until the commercial is actually aired. Aim 21 is a creative service that allows corporations to keep track of all of the ad work that they've done.

If Coca Cola, for example, has done an ad campaign in the States, it allows the branch operation in Taiwan, for example, to have access to it on the computers, and they can "re-jig" it in a digital format and make it appropriate for that market.

Next month we're launching a product called "Ad Briefing" which has *Advertising Age* in it, among other publications, and a real-time advertising news service done by Reuters' Editorial. The real-time service will fit over a database of some 2,000 global publications, a very easy point-and-click research tool for the advertising industry.

These are our major on-line clients now. I forgive Leslie for not mentioning Reuters' in her presentation, although she did have her cursor over it. I'm sure you all picked up on that. In any event you'll see we pretty much have relationships with all the major players.

We've been in the on-line news business for a good seven years, so we have a jump on some of the other content providers. I think it's important to note that a lot of publishers have simply taken their existing content and slapped it into an on-line environment and it hasn't worked terribly well.

I think one of the things that a news agency like Reuters brings to the table is that it's real-time information. It's not the same, it's changing all the time. I read the *New York Times* this morning, but I don't particularly want to see it on the computer screen. What we bring to the table is that the information is constantly changing. It's different information than you can get any place else.

Here are our major Internet clients for the time being. As I said before, I think these two groups are gonna merge in the future. In the commercial on-line arena, we get some of our revenue from subscriptions and most of our revenues from royalties — when new users come on to a service we get a percentage of that. In the Internet environment it's almost 100% advertising.

Why do people go on-line? Basically there aren't any surprises here. I think the number one reason is exploring. This presents a real challenge to the 400,000 commercial sites out there. Why would anybody go back twice? I don't know how many of you are surfers; when I go on-line, I look at a site once, and I may go back to it in six months. Primarily, I'm exploring and I'm entertaining myself. I'm looking to see what somebody's done, what's cool, what's not cool. So you have to find a compelling reason for people to come back.

Communicating is probably — if there is a killer app now that's probably the largest one. People are using the Internet and the on-line services to talk to each other; they're looking for information. And transacting is starting to come on. It isn't very well developed yet, but I think that it will play a much larger part going forward. And there's the entertainment value: fun and games.

The good news is that people think they need to go on-line. In the fourth quarter of last year, for the first time ever, more Americans bought personal computers than television sets. Most of those personal computers had modems. In December last year — I think this is an interesting one — for the first time ever, Americans who had both a color television set and multimedia PC spent more time on the computer than they did watching television. If you go into the age groups in the study, you find that with teenagers and kids in college the percentage is about 70/30 for preferring to spend time on a PC than watching television.

The growth of the on-line market is up for debate. This is our best guess: we think there are about 7,300,000 today. There are other studies that show 8.5 or 9.2 [million], but we've tried to factor out multiple users where somebody is subscribing to both AOL and Prodigy or

CompuServe and Prodigy or a number of services. In any event, the trend is that in the next two years we think that it will double.

Here's some more good news: a recent study by Mecklermedia showed that 81% said news was the thing that they'd be most interested in seeing on the WorldWide Web; 75% wanted computer related information — which shows that cyberspace is still pretty much of a techie crowd, but as Leslie said, that's changing; 68% wanted research and 58% said they wanted to be entertained with movies, games, and jokes.

Here's the bad news. I feel I should say something on that score. Not everybody's sure that they need to stay on-line. A new Times-Mirror survey just out said only 32% of those who go on-line would miss it a lot if they couldn't go on-line anymore, and this compares to 58% of newspaper readers and 54% of cable television viewers. So we still need to find the killer application out there to make sure that people want to stay on-line. This is a quote out of the survey. "A few see on-line activities as essential to them, and no single on-line feature with the exception of e-mail is used with any regularity."

The question was, "How many on-line services does Times-Mirror have?" They have one, I think. In the Mecklermedia survey, only 3.3% said they definitely would be willing to pay for information. There's still 52% out there who haven't made up their mind and say they might. Around 14% said if you gave them a free sample and they saw that it was information they wanted they would be willing to pay for it. About 30% said absolutely not, never, don't want to be bothered.

We took our first plunge into the advertising revenue sort of things with yahoo.com, which is generally considered to be the second most popular site on the Internet.

Yahoo is a very good research tool, as everyone knows, for finding your way around the Web, which is one of the problems. We talked to them about providing a real-time news component that would give them another dimension to bring even more people to Yahoo, and we're very happy with the relationship. We derive our financial nourishment from the advertising that they sell, although the relationship's only several months old and I wouldn't call the advertising particularly dynamic. It's one-dimensional, it's linear at this point. They're actually selling more ads at higher prices than either of us imagined were possible at the time.

I think as Java and HotJava and VRML and some of the programming languages become more popular and the content providers and the ad agencies start writing in those languages, I think this is going to be a very lucrative market, indeed.

Leslie said there's 400,000 commercial sites. Our count is that there are 13,000 corporations now. Those figures aren't incompatible; most sites have a number of pages in them, lots and lots of pages. A lot of things that are commercial sites are sort of a one-man band at this point, and we're counting the big corporations that have taken up sites on the Web. That's a pretty significant amount. In the United States, for reporting purposes we follow 9,000 corporations. So if you think there are 13,000 globally on the Web, that means almost all of the major corporations now have a Web presence.

What we're designing is something called "The News Machine" to fill the needs of these corporate Web sites. The problem that they have now is that the corporations use their Web sites primarily for sales and marketing. They slap their content up there, make their sales pitch, and as I said before most people are surfing the Net and they never come back.

So how do you get the people to stay at home down on the farm? They need to have some kind of unique content to make somebody want to go back there day after day after day, and what we're coming up with is a concept called the "News Machine," which will allow designer news services for each site. In that way if [Smith Kline Beecham], for example, could come to us and say "We want a pharmaceutical newswire," that goes FTP out to the site every day.

Ford could come to and want an automotive newswire, [giving them] tailored service. The concept is that we have all these big pipes of content and we can slice them and dice them anyway you want to using our coding system so that you can come up and fashion your own news service. Since it's real-time, that means it will have new content all the time. There will be a compelling reason to go back to the site the next day.

Our conclusions are that there are essentially two different markets. There's a consumer market and there's the corporate market, and we need to serve both. As I said before, in the consumer market we now think that we will generate almost all of our revenue from advertising. As the commercial on-line services become sort of mega-Web sites, we'll get less and less money from subscriptions and royalties and much more of our income will be generated by advertising. This won't be the case, we don't think, initially in the corporate market or in the business information market where people want information to make more money and they're not terribly interested in being pitched.

We think that the revenues will continue to come from subscriptions and royalties, but increasingly down the road the transactions themselves will be the most important source of revenue from our point of view. And that's it for me.

Andrew Jaffe: Thank you for being brief, Andrew, and getting right to the point. Some interesting points. Now we can get into some questions.

Let me ask a couple of questions just to warm up the panel and get in a different mode here. You can get those microphones so that Leslie can access one of them, Jim. There we go.

Just a quick run from the panel, and I just want a gut answer. [Is this statement] myth or fact? "Advertisers are ahead of publishers in creating interesting Web sites that have content you'd want to come back to."

Jay Sandom: Myth.

Andrew Jaffe: OK, What do you mean? Just briefly.

Andrew Nibley: You think that advertisers, that publishers are doing well? Yes, I think that by and large most of the publishers actually have done a better job in leveraging their assets than advertisers have.

Leslie Laredo: I don't think that advertisers realize that they are publishers on the Web. There's a few sites that are really good. The Zima site does something different. Toyota has a new site out that's pretty different. It has more content, but I think for most part the agencies now realize that, indeed, they are publishers, and that's the problem.

Andrew Jaffe: OK, good. Jay, why don't you move over just a little bit? The two of you can get comfortable sharing that microphone. Andrew, you get one to yourself down there at the end. Myth or fact? Andrew, give your viewpoint.

Andrew Nibley: Right. I tend to agree with the comments just made by Leslie, who I've been calling Lori for the last half hour.

Leslie Laredo: I tried to kick him under the table.

Andrew Nibley: It's those drugs, it's those drugs — and she's now allowed to call us "Rooters." That was a big problem when I used to interview, when I used to go to the White House. I used to say, "I'm here to interview the president, not fix the plumbing."

I think it's a mess. I think that for the content provider, it's easier to make the transition. I agree very much with the point Leslie just made that advertising agencies have to start seeing themselves as publishers. I think it will get a lot more interesting when they can do some of the three dimensional things that the new programming languages are going to do, and then I think they'll probably leap-frog the publishers.

Andrew Jaffe: OK panel, I totally disagree with all three of you. I think advertisers are well ahead of publishers. I think publishers are still trying to figure out what to do besides put their content out there, and advertisers like Ragu or Zima are getting it on how to involve people.

Up to now the true at-large advertising agencies, general service agencies that we know of, are not creating these sites; they're mostly either being created by specialty agencies like Einstein Sandom or by the advertisers themselves working with specialty providers. But that's all right, panel. I could be wrong or we could disagree — or I could be right.

Leslie Laredo: Well, you have an interesting constituent there, Andrew.

Andrew Jaffe: No, I don't think... I think I'm beating on ad agencies to catch up. Meanwhile I'm beating on AdWeek to get out there and try and surpass Ad Age. I don't know, but maybe I have a bias.

Myth or fact? "AOL, CompuServe, MSN will either be Internet browsers in five years or be out of business. They'll be known primarily as Internet browsers or they'll be out of the on-line business." Myth or fact? Andrew, why don't you start?

Andrew Nibley: I think they'll definitely be Internet browsers, and as I said, I think they'll be super Web sites. I don't think — well, I think some of the commercial on-line services will be out of business. I think Microsoft Network, AOL and CompuServe will probably be around, I don't know about Prodigy.

Andrew Jaffe: OK, Leslie.

Leslie Laredo: That's a hard one, because I think that the commercial services do offer a point of view. If they beef up security...

They tend to be more "family-friendly." I think the hardest part that we all have, including me, is that we are the inner circle of this. We are not the masses out there. They're going to get on-line next and I think that the hardest thing — because I talked to family members and I don't want to be a focus group one either — but you know, I have fairly computer-literate friends and family out there. Oh, I shouldn't say "friends and family" — sorry, AT&T.

Hey, can I tell a funny joke and answer that question? I actually had my very first meeting at AT&T back about eight months ago, and when I told my five-year old that I was going down to AT&T in New Jersey for a meeting he looked at me and said, "They don't have circles, do they?" So, who said the power of media traditionally is dead? It's not.

I actually think the commercial on-line services do offer a lot. I don't think they'll just be browsers. I think they have points of view and I think that's real important. I don't think I want to go on the Net and have 100,000 places to go to figure what's best and what's not. I think entities out there will provide rating services, provide security, be able to do more customizing;

and focusing is important. If I could tell what would happen in five years I'd be with my crystal ball making a lot more money.

Andrew Jaffe: Okay. Jay?

Jay Sandom: I think that the question is a kind of wrong-headed, because ultimately I think that it doesn't really matter what the delivery channel is, if it's a dedicated on-line system or if it's a Web-based system. I think in the end what matters is the brand identity of the offering, and here we're looking at AOL which has a very defined personality, which, in fact, has been very successful and growing very effectively and very fast.

So whether or not it becomes Web-based or hybrid in the sense of what AT&T is becoming or what the Interchange is becoming — it doesn't matter. The bottom line is, "What's the content and are people willing to pay the money to get into that content?" I think they will all survive if their content is superior.

Andrew Jaffe: OK, panel. Good answers. Myth or fact? "Hits don't count." And if not hits, what does count? Jay?

Jay Sandom: Well, that depends on how you define a hit, I guess. I think that clearly one has to be able to document who's going into his site and what they're doing within a site. The problem with hits in the past has been that if you go into any given Page, there may be a number of discrete elements that make up that Page and that may constitute five, six or seven hits per access. That's really not a hit.

What people consider to be a hit... Is there an individual going in and looking at this particular site? Where are they going? I think they do count, just like they do in mass media. Ultimately, I hate to say this to you, but again I think your question is kind of wrong-headed. It's not about the number of hits anymore, it's about the quality of the relationship that you're generating with that target. That is what this is all about. It's not about the numbers, it's about the quality.

Leslie Laredo: I agree. I think that there's some efforts being done by the Four A's and A&A and the Casey Committee guidelines on that. What's a hit? What's a visit? What's a session? What's a user? I absolutely think what's most important is, who is the user? The more about them the better. Right now there's really no way to do that. So, that's the best of both worlds. I think hits are meaningless, personally.

Andrew Jaffe: Okay. Andrew?

Andrew Nibley: Yes, I don't know that all hits are created equal. I think that a Home Page hit probably isn't worth that much. It could just be somebody surfing around exploring. Drill-down hits are much more exciting because that's the person who's taking the time to get down to a specific piece of information. If they've come through *Yahoo* and they're down in the automotive section, there's somebody who's looking for a car. That's a quality hit.

Andrew Jaffe: Okay, last question. Myth or fact? "E-mail is the killer app." You questioned that, Andrew. You feel we're still waiting for it.

This might be a surprise answer for this crowd. I think e-mail is the killer right now, but I think interactive advertising's going to be the killer in the future. I know in the interactive television trials — I know that's not a deeply popular concept right now, interactive television

— but at that time I remember being in the focus groups where people would say, “I absolutely don’t want advertising, period. Full stop, no advertising. I’m interested in movies. I’m interested in news. I’m interested in sports clips.”

Then we go behind the — I can never remember, two-way or one-way screen, I guess it’s your perspective — we would go behind that and you’d see the fellow play around with the movies, play around with the news and then go back to the BMW ad or whatever and then put it away, and then come back to it and open the door and then go away and then come back to it — and ask how much and how many miles per gallon it got.

The point was, once they saw advertising as not sort of the in-your-face, “drink this beer and you’re going to get the beautiful blonde,” but more as information, something they could control, it became very exciting to them. It goes to Leslie’s point that advertising really is going to become on-line publishing and an information tool.

Andrew Jaffe: Any other comments?

Leslie Laredo: I don’t think e-mail should be in [inaudible] killer app. It is why people go on-line today. I don’t think people will stop going on-line. I think that people will diversify as content gets better and will do more things, but I think right now there’s a need to be on-line to e-mail. I mean, I go on-line every day, every night and I do e-mail off different services, different places. I need to be in communications with people.

I think it’s different from content. Some people would say conversation, chat, e-mail are all a form of content. It is dynamic, organic content that’s being created all the time, and it is the driving force to go on-line. So I think that it is, and that won’t end.

I think that in our world we want to stay more in touch with people of similar interests and like interests who have the same passions and hobbies. I do think it is, and will be — I think what grows up around it will be important. I think, to speak to what’s-your-name, Andrew, Andrew’s point that Reuters, that the more that we can incorporate...

Andrew Jaffe: Arthur, just call him Arthur.

Leslie Laredo: Arthur.

Andrew Jaffe: Okay.

Leslie Laredo: The more we can incorporate that into advertising, into what we design so that the points about being in relationship marketing and communication is part of all of all that. I don’t think it’s the killer application. I think it’s the integration into other things.

Andrew Jaffe: I just hope that was the right question, Jay.

Jay Sandom: Once again, Andrew, I’m afraid to tell you the truth. It makes me a little leery when people constantly strive to search for one particular killer application, because really the key, the key issue in interactivity today, Andrew — he’s going to keep his subscription, it doesn’t matter, go ahead — it’s personalization. We’re not all part of the face of the mass market. We do all have our own individual needs and interests.

So I think that the search for this killer application is really ultimately wrong-headed, because it belies what we are going on-line for, which is to express our individuality.

I think that there are two things, though, that one can point to, and they are very distinct entities. One is this communication, this kind of gathering of like individuals, which I

think is something which we see in chat and conferences, where people strive [to connect] because of how alienated we are in our society today, frankly. We need to go on-line and talk to one another, to people who are very similar to us. That's one major component, part of the killer application that you're seeking.

The other really is a hybrid. I think if anybody looks at compelling Web sites today, coming at it from an advertising agency perspective, it's not advertising. It's really interactive multimedia marketing communications, which means that it's transactional, which means it's information and it's entertainment — it's not one or the other. For any site to be successful it has to combine all of those elements, otherwise people are just not going to come back.

Andrew Jaffe: OK, let's have a quick fifteen, twenty minutes of questions and then we'll break for lunch.

M: This is a question for Leslie. There's a lot of talk about the power that the on-line companies bring in terms of having a community. Do you see any opportunity in offering communities through any Web sites from companies? That community type of feeling?

Leslie Laredo: I don't know if the technology's quite there yet. I don't know the Web. The Web technology means are better, but chat on the Web is not like chat on on-line services, if that's the community you're talking about. I think it's an issue of technology more than anything. I think the on-line services can deliver the community with the services they offer.

M: [inaudible]

Leslie Laredo: I think community is exploding everywhere, and I think people are getting together around content that is important to them. They keep going back to it and can share with people who have like interests. I think if you look at the special interest model, that's really what is happening on the Web and everywhere. It's really about special interests, about people ending up places they want to be because they choose to click on that site — unless they're surfing, which is a big problem. But what they end up doing is going back to it all the time.

In research we've done [we've found] — and not the novice but the experienced Web users — they really only visit half a dozen to a dozen sites. I mean, they'll surf a lot, but they keep going back to those six to twelve sites that they like and are topics of interest to them. They want to talk, communicate. I think the world is sort of segmenting into this, these microcosms of communities around special interest topics.

M: As we start crossing cultural and political boundaries with adverting and the way different people in different countries react, do you see it evolving to where Web page advertising is reacting dynamically to the person or country or place that the hit is coming from?

Leslie Laredo: I think, seeing this — I don't remember the site, but maybe at Levi's or one I just saw recently — you can connect to the U.S. server or to the European server, and you go to the European server and you can get a different site in a different language. So it is happening. I think the big issue in developing a really good site is — a year ago I was cautioning companies, before you go up on the Web, remember you're global, and what makes sense here may not make sense in Tehran or India or Switzerland, and it's a big issue. So I think you see more and more of that.

The more sophisticated companies, especially global companies, are doing it and I think that is important.

Andrew Jaffe: Jay, do you want to add anything?

Jay Sandom: Yes. Actually, one of the reasons why we built Charlie was because we have a lot of multinational clients and they were concerned about not only the language issue but also some of the other issues — use of color, use of design elements that were considered unlucky in the background, for example. How do you deal with those individuals?

Another thing was speed of access, where we found some people coming in at very low speeds and some people coming in — say college kids — coming in at T-1, but a free T-1 line is a college. You know, you want to be able to provide them with the best experience possible, so you need something behind that site in order to really understand how they're coming in, where they're coming in from, at what speed, etc. so you can personalize it and make it relevant to them.

M: We've been dealing with this issue for 150 years because we sell globally, but it's an interesting one. When you're hooking up with a content provider, how global is their content? For most Americans the fellows who tried to blow up the World Trade Center were terrorists. It's a perfectly acceptable way to describe them.

If you're selling into Iraq those people are better known as heroes, as being the only people who had enough guts to take on the great Satan. So as a news organization we have to say, "men who were alleged to have blown up the World Trade Center." I think that as advertisers you're going to be very careful about the content providers you hook up with and how global a view they have.

Andrew Jaffe: In the back?

M: This is for Leslie, to your point of inner circle and outer circle. Does AT&T have any plans to provide direct consumer access to the Internet for the 90,000,000 outer circle people, and if so, can you do it at local telephone rates?

Leslie Laredo: That announcement's being made by WorldNet, AT&T WorldNet, either today or tomorrow so I would look for those announcements. I don't actually have the answer to that; I don't know. We're a new division that AT&T bought and we kind of keep our heads in the sand in Cambridge and get our products done and working.

There's lot's of stuff going on. I think the big point is that AT&T announced a 'global Internet initiative' that involves access, applications, transactions and content. And we're part of the content group and very proud of what we produce. But go to the booth. I know WorldNet is at the booth. Talk to them about their plans.

Andrew Jaffe: Over there, yes.

M: To the moderator's question about hits... You all expressed kind of a dissatisfaction with that measurement and talked about quality. I think Leslie went too far as to say they don't matter. What does, then? What other measurements? There's a lot up on the board. Maybe it's a qualitative measure that you guys have that you're more comfortable with? What other variables that you are using?

Andrew Jaffe: What would you like to see us measure?

[Panel]: When we look at any given access to a site we look we look at the frequency that individual's going into the site. We look at the amount of time they spend within each of the discrete modules and we look at what those modules are against their previous experience in that site. That gives you a very good, very robust kind of perspective on that individual.

You know, we heard about drilling down before. It's one thing to sort of browse across the surface and see the Home Page of a site; it's another thing to really go down and spend some significant time at a given site. We've found that people will spend 7-8 minutes, on the average, with some of the sites that we're developing versus you know, sort of clicking through your 15 second spot on TV here. What are they looking at? How long are they spending with that information and what is their history in that site? It gives you a really clear picture of that consumer and what they want.

[Tape change]

[Panel]: I think advertisers are asking questions of publishers and I know publishers have been asking questions of panelists, including Leslie, with a panel that we did down in Florida about six months ago. Can you tell me, are people really looking at my model, my Page? How long are they there, are they there long enough to get a message? It's the same questions that they're asking in a magazine like *Edward*, but the very fact that they just saw a banner as they were glancing by the Home Page isn't making them feel comfortable yet.

Leslie Laredo: I don't think banners and buttons on tops or bottoms or on scrolling Home Pages is significant. I just think that IBM or whatever, or Lotus, or Sun, or whoever's logo up there is enough to get someone to want to click on it — unless there's some really strong contextual relationship between the brand and the context. Other than that, I'm out there all the time and I'm not getting it.

It's not like intrusive advertising, where there's a great headline, a great graphic, another way to get someone involved in it; and that's why I think that those kinds of hits, I think it's more or less people stubbing their toes across something, opening the door to see what's there and then pop back out. What I'd like to see down the road is, I'd like to be paid for every true customer I deliver to anybody. So you tell me what your cost of customer acquisition is, and I can deliver that customer to you, bona fide that they bought the product and it will cost you a hundred dollars or ten thousand dollars, depending on what your product is, to get that customer. I want to be paid that, because if I can do that and you don't have to go through any mechanism to get that customer, then I want to be paid that. That would be my ideal down-the-road scenario.

It's really about the relationship. It's the lifetime value of the customer, so I can deliver that person to you today, and they're worth \$60.00 today and they're \$100.00 next year and \$1,000.00 the year after that. I want a piece of that, I want a piece of that ongoing, and especially if they're using my forum and my communications to maintain that relationship, whether it's through e-mail or through an updated site or whatever. That ultimately would be the best scenario.

You know, we'll get there yet. Bill Gates said 640 was enough ten years ago, so that's why I put that slide up there. I think we will get there.

M: [inaudible]

Leslie Laredo: About pricing?

M: Yes.

Leslie Laredo: Well, fortunately I'm not selling hits on Web sites so I don't have to make that decision. I can talk to you afterwards on how I do pricing for the Interchange service.

Andrew Jaffe: We'll come right to you after this question in the back.

M: This is for the panel. What do you see happening to the Internet as the more TV-based information superhighway rolls out in a number of years? Do you see that being a function of the Internet, or do you see the Internet becoming a function of that?

Andrew Jaffe: Is interactive television going to threaten the Internet as the Internet becomes even richer than it is today?

[Panel]: I'll take a stab at that. I seem to be talking a lot about convergence today, but I think if you saw the announcement earlier this week about [InterCast], I think that they're going to have to gateway to one another; there will be some video seen on the PC, and I think they'll use a vertical blinking line on televisions to have Web connections. I don't think that they're going to merge the way that commercial on-line services and the Web are and become seamless, the way that AT&T is trying to do; but I think that they're going to have to make reference to each other, and televisions are going to be good at some things, PC's are going to be good at other things, but they're going to have to interact.

Leslie Laredo: I just want to step back and keep talking about the customer relationship and the time that they spend at the Web site, and about the customer support when they're sending e-mail and then the bottom falls out because there's no support behind that. [You need to] talk to these customers where you're starting to build a relationship. They ask very specific questions through e-mail about the Web site about your products, whatever, and a lot of companies are finding they don't have the support there. They're really losing out on opportunities, and people seem to forget about that. They just e-mail. Just drop into a black space.

Jay Sandom: That's a really good point. In fact, that's one of the major weakness we've seen in a lot of companies, in the speed of turnaround in response to those questions. If you're not back to that individual within 48 hours or whatever, then your cyberbrand really starts to suffer. That has been one of the hardest things to talk with clients about, to make sure of that.

In some cases in Australia we were able to hook up with their help desk that was also on their phone system, so they had an existing body of individuals that were already handling that kind of information, who were all PC-equipped, using the PC as a device to access the data that they would then talk about over the phone. So in those cases, if they have a body of individuals in place it really helps. In the case of General Motors and some of the automotive clients we work with, they really don't, unbelievably enough, have a lot of support in some of these areas. And it seems to me that the larger the organization the more like a supertanker they are in turning around and getting just a bunch of guys in there to answer the phone or to answer via the PC. That's been a real problem.

The other one, which I think is also related to this, is the idea of maintenance of the site. A lot of people say, "Yeah, I spend \$300,000 or \$500,000 to build a site," but again, if it's not kept fresh, if they don't understand that we're building a different kind of content... It is like the

publishing business that has to stay fresh all the time to keep people interested; [if they don't] then it's going to fail and you've wasted your money on the outset in developing that content.

So there's similar kinds of issues, and that's where most clients tend to fall down.

Andrew Jaffe: Go ahead, Leslie. We've got time for one or two more questions.

Leslie Laredo: I think you hit on one of the most important issues for this business, the issue of how big companies can change their infrastructure to handle that. One company that I know of, or I understand is doing this, is UPS. They have e-mail open, sending mail to UPS, and they go through great pains to be able to integrate their e-mail to their customer service people so when they're not answering phones they're answering e-mail.

I think that is a trend corporate America is going to take if they're going to embrace the new media and the Web and all the new technologies. That has to change, and it demands a lot; it does demand a PC, it demands a hook-up for your e-mail services to your customer service people, and it's a big challenge. But I think that's the way that it is going to have to go. I think the companies that are real innovative and start addressing the infrastructure issues to deal with new media, and not just make some pretty pictures but get great agencies to do stuff on the front-end but not the back-end, are the ones that will be the real winners. I think that's a great point.

Andrew Jaffe: In the back.

M: Yes, Leslie had mentioned that very relevant ad banners in the vicinity of very relative content seems to make sense for technology advertisers, etc. But with consumer advertising, I wonder if there hasn't been such an effort to keep the advertising unobtrusive, that it's almost not as effective as it could be. Essentially you're saying advertise to me, which is almost foreign to the way we've looked at advertising in TV, radio, even print. How do you see that changing?

Leslie Laredo: I think it's a big creative issue. For example, people have mentioned Ragu; Ragu is being [touted] as sort of one of the better Web sites out there with a commodity-type product in spaghetti sauce on the Web. But they've done something very interesting; they have learned to speak Italian, they do a lot of e-mailing out. I've joined their list, so I get e-mail every few weeks from Ragu reminding me to come back and look at new recipes. And what they're doing, and I think what's real important with commodity-type products, is to have information as part of their brand asset.

The big issue here is, it's spaghetti sauce. Well, not a whole lot, but there's other ways of using information about the brand and related issues about the brand and about the product that can be used as assets to the on-line experience. So I think part of how you get people there is the hot list, what looks cool, and a lot of it is how you integrate your URL and the packaging and the promotion.

Toyota has toyota.com on every ad that they do now. You're seeing it on brochures, and I think that the integration of the on-line with other media has to happen and people go there because they start to depend on it as the place for more information — and this is using information as a brand asset for products that you traditionally think of as having lots of information needs, like toothpaste. Well, there's thousands and thousands of things that you can say about toothpaste, if you're a researcher or something else; you just have to find what's interesting and useful to the rest of the world about it. That's the creative challenge.

Andrew Jaffe: One more question.

M: Yes, back to the global issue. I'm from London. From our perspective, the Net still seems to be a very "U.S.-centric" medium. Can you comment on that?

Andrew Jaffe: Andrew.

Andrew Nibley: Yes, it is. Mostly people going up are U.S.-based, though I will say that the U.K. seems to be next in line. The PC penetration that's coming in the U.K. is coming very rapidly. The commercial on-line services, particularly CompuServe and American Online, are moving in quickly.

What we see is the real possibility out of Asia and Continental Europe for individual services developed in those languages. So I think it's going to be a huge explosion in those markets, and those will all be seamless to the Web in probably the next two to five years.

Andrew Jaffe: Well panel, I want to leave the time for the people to grab a little lunch, and it's a little awkward around here.

I think we've had a good vigorous discussion, with some wrong-headed questions that got started in the right direction.

Andrew, the drugs your five year-old is giving you are good drugs, you made a lot of sense today. Leslie, I've enjoyed being on another panel with you. Jay, I'm going to work on my questions and I hope to be asking you wrong-headed questions again in the future. Thanks a lot.

ADVERTISING FORUM BRANDING IN INTERACTIVE MEDIA



MODERATOR

Andrew Jaffe

Vice President/Executive Editor, *Adweek* Magazines

SPEAKER

David Carlick

Senior Vice President/General Manager, Poppe Tyson

Andrew Jaffe: The magazines have arrived, they're at the back table, the refreshment table, and we've got the New England edition of *AdWeek*. We've got some copies of *Media Week*, and what's interesting to me is that the Museum of Advertising in Portland has organized a traveling exhibit around the image of women over the years and our [Creative VP] has a little view of that and her own views on what's happened to women. There's good and bad; as you know, sexism is not dead yet in some of the agencies and some of the clients.

The other good news is that we're up, this is really the Internet we're showing you, and this is Poppe Tyson, designed by our next speaker, so that's pretty exciting. Our next speaker, David Carlick, tells me that he'll be using mostly slides because he didn't trust me. And David, you were right. It's taken us three or four hours to get it [set] up.

Poppe Tyson is a very well established agency. It goes back 50 years in New York, and it specialized in business-to-business advertising. It's owned by [Bozell], and a couple of years ago it bought an agency in Silicon Valley called Carlick Advertising, which at that time had among its clients Hewlett Packard, Silicon Graphics and some other technology clients. In the last few years [Bozell] has woken up to the fact that this whole thing is going to become important and very rich to its clients, and that it better establish some leadership quick. It designated Poppe Tyson to be the point agency in the [Bozell] family to get this done.

Poppe Tyson established itself a year ago on the Internet. It had examples that it had done for Hewlett Packard, Silicon Graphics, Intel, Netscape and it also designed the Clinton White House site. Today the company has offices in New York, New Jersey, Pittsburgh, Cleveland, Los Angeles, as well as in Mountain View, where David is General Manager. He is about to give up the reins as General Manager of the office so that he can concentrate on electronic marketing communications for the whole company and he will be the head of an electronic team.

David has spoken on a number of panels. Most recently I heard him talk about on-line publishing for the Magazine Publishers of America, and I'm looking forward to this presentation today which really gets down to the basics for us who care about the advertising world, [which we] worry about every day. We have a question, which is: "How do you establish brand equities in interactive advertising? How can you build on the brand equities that are already established for these clients, and how can you translate some of the lessons that we've learned in traditional media to these new interactive platforms?" With that, I'd like to introduce David Carlick.

David Carlick: Thank you. We have a few people from our office here, so I took the liberty of redefining my next job in having Andrew announce it when my company hasn't really given it to me yet, but now we're publicly committed. The real reason I needed more time is because, at the insistence of the people at [Bozell], they say if you're going to understand branding, you have to understand golf, so I've taken up golf this year. I now understand what real advertising is like. I come from Silicon Valley, we don't have real advertising there, and we didn't used to.

This is our site on the Web, and you can visit it at <http://www.poppe.com>. I have brought with me the slightly higher-bandwidth version of this; so, if I can switch the slide projector from the on-line, then I'll be able to make that. I [can] get this all done in my allotted one hour, so I'm going to turn off this box here.

Branding in the electronic media; I'm talking about branding on the Internet as a fairly large topic, and we're going... I was told that I had 2 hours to speak, and then one and then they want to leave some time for questions, so I'm leaving out my first trailer that I had of my baby pictures and my youth and I'll move right into the discussion.

Branding in a digital world, in our opinion and my opinion, certainly [represents] a new class and new ways, so what we've been doing at poppe.com, which is the electronic group at [Bozell], is a worthy experience. When we've made up the program here — oh, I don't know how many months ago — it makes your speech that much more irrelevant because your business plan changes week to week because the market changes from week to week and month to month.

So what we have is — I will call it “news from the digital front,” because it's news from what we have experienced in our work. So, hopefully, in this discussion of branding and advertising in the media I'll be able to help you in avoiding some of the pitfalls that we have stumbled through and help you see, perhaps, better ways to use this area. Then, just because I like to be contrary, I'm going to disagree with every previous speaker and take a different point of view as to what this is and where it fits into advertising.

We did the design and navigation for Netscape, you've seen that. It's an area that has plenty of visibility, so the little “scapes” are there, and our original work shows us that the pointer is better. Now, among all the various myths that the Internet has had, one of them would be that there would be no advertising, and as Leslie Laredo has pointed out, “people are beginning to discover that it's quite the opposite, it'll all be advertising, this is all paid space.” But the definition of what advertising is has changed. Is it advertising here on the Netscape site, a group which we've recently spun off? I tell you, I get a commercial like Leslie — Leslie got a long commercial, she had practically an infomercial.

We have a group called Double Click that is represented here, that represents sites like Netscape. And so like with these ads: when you get to the Visa and MasterCard site, is that advertising? Which part does the agency do, and which part does the client do? Which part belongs to the sales force? The good news for us is that it all has paid revenue for us, but the bad news is for our parent company. It's not bad news, but it's just a very difficult transition to move from a world that's bounded by 8 1/2 by 11 pages or 15 second spots to a world that's unbounded, undefined, as deep as you want to go and as wide as you can travel.

We did the design for the White House and we're working on the new one. And we have tremendous insights into how the government and the political administration see this, and one of the things that you're going to see coming up over the years is that government is going to learn to use this, just as we are learning to use this for our clients in what we're calling “branding” applications.

There's a way to increase the fundamental service that you deliver to your customers and prospects, and lower the costs of doing business — which is a wonderful thing in the case of the government, because this means the citizens can access the services and information the government has to offer without the actual government expense of people to walk them through it.

This poppe.com group is larger and more active in New York than the Silicon Valley group, but it started in Silicon Valley because that's where the people who were going up on the network were. One of the things that we learned in working for companies like Network General is that what people wanted most from the network — and where a company like

Network General comes in — [is to] understand their brand. And you may not think that a company like Network General has a brand — a brand is Levi's, Levi's has a brand, Chrysler has a brand, Network General doesn't have a brand — maybe they do and maybe they don't, but in their little world they do have a brand, they're the sniffer, they're the company that gets the most bugs out of networks.

And the thing that makes their brand interesting and useful to the customer is that these are complex areas and complex decisions for people who don't have very much time. So the way Network General uses the Internet to improve their brand equity is to service their customers and prospects with the information they need to do their job.

Does this relate to a Chrysler? Yes, as I'll show you. The same thing is true with monitors, the same thing is true with Hyundai; but one of the more interesting experiences of a Hyundai, as far as the learning term goes, defines one of the things that changes the whole business of agencies here. We were hired by Hyundai Electronic's MIS group, we are not hired by the marketing people; and this is oftentimes the case of why so many Internet sites are up without the benefit of an agency. The MIS people decided that "this is networks," and networks are taking a very real important and strategic role in the way business works and the way they communicate with customers and prospects. They were going to get something started, so they hired an ad agency.

Then we have the area that we have worked in in helping our parent company to become computer literate, and help their Chrysler stay up-front, which is the Chrysler Technology Center. This speaks to, in a sense, the traditional, and this is a problem that we faced about four months ago. The demographics of the Internet change every two hours, as far as the surveys go, that I can tell. It seems that doing the research on the Internet right now is [like] trying to do a focus group panel during a riot; you're going to get a lot of different opinions all at the same time. "Basically it's growing, and it seems to be mostly males or females, they either use modems or digital lines and they use it either at work or at home." So these are things that we can measure.

The Chrysler Technology Center goes after the idea of traditional branding in the sense that we have an audience on the Internet that is, after all, made up of people who use computers, and people who use computers are in the computer industry and they're interested in technology. So we use this platform or this medium to extend Chrysler's brand as a technology leader, and we show their wind tunnels, and their test areas and environmental freezing rooms and their new vehicles.

When you go to Detroit — I didn't know this, but you don't say "car," you have to talk like a highway patrolmen. You have to say: "Step out of the vehicle, please," which goes against all the things I know about the English language, which is to put everything into one syllable or less.

Then, again, with those collaborating [with us] we worked on the laws of what I believe is the first promotion of a Web site with URLs on broadcast television. The Indianapolis 500 last May promoted the Valvoline site and generated hundreds of thousands of visitors to come in and look at things on the site that had to do with fleshing out the viewer's experience of Valvoline's race team in the Indianapolis race.

So, one of the things that I like to do [is] to disagree with everyone to point out — and this was something that I learned in preparing for the Publishers 2010 conference — that people are constant and technology is not. Technology is really the driver here, or as they say in Silicon Valley, "You can't fight physics." And the physics of all of this are fairly straightforward.

In 1980, when I started out in the personal computing business... Well, actually, I picked 1980 because this publishing conference asked us to predict the world in the year 2010, and so

this is the year 1995 so I just subtracted 15 years using linear mathematics and said, “Well, let’s look at 1980 and see where we were then, and predict the year 2010.” And that isn’t so far off when you consider that the microprocessor has been invented and Moore’s Law has been in action.

And Moore’s Law is the law that predicts that the density of devices on a semiconductor will double every 16 months. That’s actually been fairly true of networking and screen display, in real dollars — not adjusted for inflation in 1980, when I first started selling personal computers. We’re so actively involved in the Internet because we were around at the launch of the personal computing business and saw how it can go from something that has so much potential to something that starts its commercial success quickly, and we decided that this area was going to do that.

In about 1980, a \$3,000 computer had 60K or 64K for memory, and this is a deluxe model. Most people bought it with much less. If you had a dial-up modem [it was a] 300bps modem, and if you had a direct connection of any kind, a digital line, chances are it was a 56 kilobyte line, and the average person in our industry or in our world spent zero hours a day on the PC.

In 1995, today, if you go to the computer papers and look in there you’ll find that the screen pixels are on the average of 786,000 and that more and more systems are showing up with over a million. [You’ll find] that the average memory is 16 megabytes and the dial-up speed is 28,800 bits per second, and the direct connection, more often than not, is 1.5 million. And then, just using the simple laws of gravity, you project that in 10 years you will have X number of millions of pixels available in some form or another, and we’re all be lugging around 600 pound cathode-ray tubes that can show home movies and we’ll have them strapped to our wrist and it’ll be the first PDA that really works.

There’ll be on the order of four gigabits of memory — and you think there won’t be, but if you read [George Gilder] you’ll see that he has proven that the only rich software people are the people who use too much memory. Dial-up speed will be on the average of today’s digital speed, which is 2.6 megabytes, or whatever, and the direct connections will be 36 and the kind of speeds that are now being given out by the network industry.

What that all basically means is that in 1980 that computer, that little \$3,000 thing there, gave Morse Code to an industry that by 1983 was being named by *Time* magazine as Man of the Year. I don’t know how they thought of the computer as a man, but they named it the Man of the Year. It should have been the Person of the Year; but then we have a writer up in San Francisco, Herb Caen, who thinks that to be politically correct you no longer have your mailman, you have it delivered by a mailperson.

In 1995 we have another of these flashpoints. 1980 had the flashpoint of the microprocessor and standardized operating system; in 1995, more or less, we have the same thing, when all this computer horsepower arrived and, of course, the digital Internet arrived. And the digital Internet did the same thing for the Internet business that the explosion of the microprocessor and standard operating system did back in 1980, which is that it just created this change. We had personal computers in a sense; Digital Computer Corporation made their one-user system, but until DOS and Apple standardized things where people can write standardized applications and run them on standard microprocessors with more or less open industry standards that everybody can make cheap and people can have happen, it didn’t turn into a landslide.

As soon as there are open standard issues that turn into a landslide — we have had network and dialup networks and all kinds of proprietary networks follow the same period of time — but until there was a standard by which anybody can have a file, read by anywhere in the world, by any computer, by any microprocessor under any software, we didn’t have that

explosion. But when that standard emerged the explosion emerged, and you all know the story of going from three to 50 to 50,000 to 120,000 of registered commercial users and all the things that go with that standard.

So we have to prepare ourselves and our agencies and clients for moving into that world, and what that world basically is is the worst in the universe, one that we're calling "disintermediation."

Now, the Clinton Administration is very delighted with the concept of disintermediation. They think, and rightfully so, that if you can go to the Internet Web site and get the Administration's position on the issues that face the voters, it would be a lot like what happened during the last election when people got up and had a citizen's town hall and asked questions about things like "Will there be jobs," and "What are you going to do in foreign countries?" as opposed to things like "Were you really out with Fawn Hall, and were you having an affair?"

And at the same time we are facing, in the media world, a disintermediation of a whole new class of information brokers that stand between our customers and us, as advertisers and sellers. Oftentimes that information broker is someone that wears a headpiece, that sits on telephone and answers 800 numbers, and a lot of what companies have been doing in terms of building is trying to reach people at various levels and trying the process. I'll go into that as we go along.

The basic deal that we see happening here — and I'll give all the examples — is that this is not a medium; in a sense, it's a computer platform, and it's giving people a shortcut around what were the traditional media interpolators and [giving them] a new way to look at things. That is the good news and the bad news.

So, in taking this as an open network publishing model, we've put up price for basically every car company that has a site. *Batman Forever* is there, and you can see a promotion for all the paid entertainment. *Mercury News* is there. Knight-Ridder just bought a giant server for every newspaper in their network, and the newspapers, in my opinion, have swung over from the idea that this is a perilous feature indeed, and maybe they can wrestle the newsprint demons to the ground and go on with life as it should be.

And then, secondly, we have things like branding applications, which are the more interesting way to view this Net, rather than just looking at it as a medium that has content. Let's just translate our own body of experience into this, because our own body of experience is as a medium to talk to people. What we're really talking about here is not just a medium; we [are] talking about what is actually an application platform, a platform connected to a medium that runs software.

And so we see things like Federal Express letting people call and not going to headsets, and banking people really moving hard to have you do your transactions, and Ticketron is really moving hard to have you call up and book tickets electronically, and the reservationists won't be far behind. In the *Yellow Pages* — people are positioning themselves to get out of the printed *Yellow Pages*. Lands End has come up with a catalog, and we're seeing all the catalog companies seeing the economics [of this]. PeaPod is delivering groceries to the home.

In an agency sense, we woke up one day and said "Here's our old funnel," — I pulled this right out of the old Forrester report, which is a good report of what the Internet is — and it said, "Well, here is how it works. What you have is an awareness, an awareness like we have of television, radio and print." I'm sure that most of you people are aware of this "funnel" concept; this is a top/down presentation.

And — if you will move closer — through seminars we give them the trade shows, and we give them the literature and we get them to go on the Internet to the Home Page and then

we get them to the store and we get them to order, and we get a salesperson in there to actually extract an order from the fully-aware and cognizant consumer.

The thing that is the most unique here is... Well, wait a minute. We have awareness, we have browsing and exploring, and all of a sudden you are exposed to ads and companies that you may not have heard of. We're out there with awareness, and I open this thing up and it starts to behave like a direct mail piece, it's got a call to action, it's got offers, it's got testimonials, it's got everything in it. Hold on, it's starting to look a whole lot like, maybe, literature. I've got all the specs, I've got all the white papers, all the stuff I need to buy, all the comparisons, and right now it's starting to look like a store. It's a kiosk, [it's] got demonstrating, I can download stuff and it goes to the customers.

So what we're trying to do, as an agency, and what we're trying to say is that this Internet won't sit still and behave as one thing, and it won't let us define it as one thing, it just wants to meander around and do a lot of stuff.

And what this means to agencies and to clients is fairly interesting here. Using the old "15 year, all things are linear" model, in around 1980, according to [Bozell] members, marcom expenditures — being 100% of marcom expenditures, although most of our clients' marcom expenditures never hit 100%, and advertising in 1980 was a simpler, better world — 70% of the marcom budget was advertising, 30% was everything else. In 1995 — and these are our parent company numbers, more on the order of that 100% marcom — 40% is advertising, as we call it in media, that reaches people in a semi-intrusive way, and 60% is other things.

And what has grown, the two factors that have caused it to change, are that one, the money has gone somewhere to be measured and so direct mail and direct response, and coupon programs and promotion have gotten a disproportionate share of the ad dollar, because all these dollars want to go to where something can happen.

We have, in the computer business, a constant battle to kind of try and hold branding dollars in the product branding area, because the company knows that if they load all those dollars into the circulars for "best buys" in the computer product stores they'll actually be able to count products that move — and people like to be able to count products that move with their ad dollar.

Secondly is that organizations are changing and brands are changing and organizations are driving decisions further down, and so you have people who have products to run and don't have a promotional budget big enough to aggregate an ad campaign — but they have a promotional budget big enough to promote a sales force with, or to run a seminar program, or to hand out T-shirts, mugs and hats.

In fact, today the T-shirt, mug and hat part of the advertising business is as large in billing as the print part of the advertising business, which I think means it's not only a medium, but a large and an extra-large.

The Internet is nice for us as an agency, but it changes our realm because not only do we have the MIS people talking to us and the PR people talking to us and the product people talking to us and the sales people talking to us and the channel people talking to us... but we're able to go out on the Internet and bring up promotions that are departmental in nature or bring up things that can be specifically tailored to the individual groups. Who is this medium for? It is viewed with great trepidation at our organization, our parent company. I enjoy it. They're excited by the future, kind of like "As long as it happens after I collect my retirement." But they have great trepidation about the future arriving next week and screwing up the TV business, the radio business and the print business. In New York we have to deal with this.

One way to deal with this is to divide the world into groups of two. I have always maintained and believed that there are only two kinds of people in this world — those that

divide the world into groups of two and those who don't. I was proven mathematically wrong — there are three kinds of people in the world: those who can do math and those who can't.

The two that I divide the world into are couch potatoes and interactives. I'll take this extreme and I'll say that we are not going to change the person who watches television into becoming an interactive user in the near future. It's just not going to happen. We all go through our moments of wanting to be a couch potato.

I will make the argument that I do not want to sit and argue about what the ending of *Frasier* should be. I like the way *Frasier* is written. I want them to send it to me, I'll watch the commercials that come with it, and when I'm sitting down and watching television I want to do that. And by the way, that end of the spectrum is populated with a lot of people who consume a lot of media, who watch a lot of television and listen to a lot of radio, and they don't use computers very much.

If they do use computers they're what we call in the business, "directed users," which means they're trained to fill in a form on the computer. They're meter readers; you can't drive without touching a computer, so we're all basically operating 280 horsepower computers. This is the Silicon Valley view, and in fact the computer component in the cost of cars is passing the engine component. We like that. It makes our business good. But at the other end is this whole new class of people, and I will give you a demonstration from my focus group, which I'm calling the "interactives," and the interactives are this class of people who are on-line and [know how to use computers in their daily lives to control and manage their time.

You have to understand the way they use the computer in order to understand how to extend your brands to them. I don't believe in trying to convert television watchers into interactive people. When the choir has more money, which the interactives do, and when it's more influential, which the interactive demographic is, then it's more motivated, which they are. You should definitely preach to the choir and let the rest of the people take care of themselves. The Internet is a medium, and it's going to be like print, radio, TV. Or is it a platform? Is it a computer that people use? I'm coming to the belief, through our work, that our interactive customers don't want content, they want time. What they're using computers for is to manage and control their time.

Content may be part of it, but they're just not translating [inaudible] from a medium before. Here is a happy user's computer; so where does this computer go in a day? People are trying to reach customers on their computer as their work. There's word processing, which is Internet issues and poppe.com strategy. They might have presentations that they're doing because that comes over their computers; they may have a calendar — which is [another way], through calendars and utilities, how people manage their day — so up comes a calendar. They may have a database to keep all the people in contact with what they do. You're familiar with all these applications.

There's the one for [Scott Heiferman] at Interactive, who is making the SRDS of Internet sites, and someone may now actually go to an advertising agency. What just happened here is that the Internet has done something — I'm on my computer doing all my stuff, which may come to me at my home or at my office, and all of a sudden I've kind of lost track of whether it's on my disk drive or the office disk drive or the world's disk drive, and that's going to become increasingly the case. I just know it's all there when I want it.

This is different from CD-ROMs, where you have to go out and mount them up, and different than proprietary services where you have to log on. This is a digitally connected computer that sends off packets when you're ready and doesn't when you're not, and makes the world look like your hard disk. What happens on the *San Jose Mercury News* is one of the most interesting anecdotes.

While I was at the Publishers 2010 Conference, we were talking about advertising and banners. As you know, I'm not sure, but one of the things we're learning about advertising is that about 5% or 10% of the ad banners sold by my account are representing Netscape and Playboy and a few other news sites that are coming up. I think that Netscape will probably pass 15 or 20 million dollars in paid ad revenues for ad banners. The *San Jose News* found out that people are more interested in the Help Wanted, but now the *San Jose News* has to worry about some Silicon Valley start-up that has created an on-line recruiting agency for high-tech people and is driving at the heart of the biggest revenue section of the paper.

That's the area that's getting the most readership, and it's getting a bit confusing. If one of the best read sections is the Want Ads, why don't we sell ad banners on the want ads?

[Tape change]

David Carlick: No, really. PeaPod is a start-up and Yahoo is a start-up and Architext is a start-up. We've got several venture start-ups who are looking to advertising revenues to build their brand, and these are services that are being delivered over the Internet and they are, for the most part, promoting themselves with advertising on the Internet by exchanging banners with other sites.

In a sense, we go out and build a brand by building up a core customer base and getting people to like it, and then getting it promoted; and then advertising shows us that brand, usually 2 or 3 years after it's been running and well after it's been established in a community and in the buyer community and in the channel community. Certainly it's important, and then we start in the image of brand building.

In fact, the most expensive and catastrophic start-ups in Silicon Valley history have been ones that have tried to build brand before the customer or marketplace had really defined why they wanted that product to begin with. So it's much more logical when you're taking things like that to do more research and development. Netscape is on their third brand ID, and more power to them. If they stuck with the traditional idea to stay with their original logo and image, that wouldn't have been appropriate for what they're trying to do right now.

I want to ask a question to this morning's panel, as we deal with crossing political boundaries and different legalities in controlling issues. For instance, that ad there or that page there would not be allowed in some places because they don't allow competitive advertising. On the other hand, the idea of putting up a server in the U.S. for U.S. customers, and a server in another country for their customers is a bit naive, because as customers get more sophisticated and more cynical they're going to say, "Are they telling me what I want to hear, are they telling people in other parts of the world?"

M: [inaudible]

David Carlick: The high-tech business is with companies that build their global market by giving the volume to compete in the U.S. market, and then making margins that are just absolutely unholy around the world. And this is a big problem, because pricing starts to leak out.

We will, in a sense, start to see a global marketplace, and it's going to be a problem. I think it's actually going to be a solution; it'll open up more markets than it closes, but being able to get \$6,000 for a computer you get in the U.S. for \$2,000, or \$50,000 for a car in the U.S. that you sell in Germany for \$30,000 will sort of go away, won't it?

M: What kind of pain do you see as that transition takes place?

David Carlick: Actually, I see not just that, but an immense amount of pain in the restructuring of the entire sales channel of companies as they experiment with this. We have companies that are sold through multiple distributors, all with different prices, all that serve different areas. The auto dealer channel — I keep coming back to that, but it's all a product we know and understand — is one that is perilously poised on the brink of an abyss as to how people are going to buy these, because a high percentage of cars are being sold through brokers.

I think the [inaudible] started in Houston, and by the way, that is a good one. I like that. I have one that I'm starting. I'm going to go offshore, and this is the last time you'll see me at one of these conventions, because when I get my site up I will be so wealthy... I'm going to charge \$10, you send me your naked pictures and you will streak the Net. I will send you back an e-mail when your pictures will be up for Net-streaking and you'll be up for five minutes — unless it's for a birthday or anniversary, in which case it's \$25 and I will then have millions of people mailing in naked pictures.

We'll have categories like Net-streaking, full frontal view Net-streaking while not looking, and I will actually have people paying me to work for me because all they'll be doing is scanning in pictures and putting it on the files. It's going to be a great business. There's all this money in the mail for this site, so this is the last time you'll see me; but I can't do it in America.

M: Speaking of cross-country issues, I work for a company that sells consumer drug products, and as we venture out into the Net we have a lot of questions about the kinds of claims you can make for a product. You can make certain claims for a product in the U.S. that you can't make in Europe, and vice versa. And, of course, whatever you're putting out there is going to be seen worldwide. We can see an advantage in that, because we could put the message somewhere else in the hopes that our American consumers can see it. I just wondered if you're familiar with any of the laws and any of issues surrounding this point.

David Carlick: The bad news about all this freedom is that the Internet is going to become the lawyer's right-to-work act of 1997. My opinion on the subject has always been "Why is it that lawyers have to wear ties?" and the answer was explained to me by lawyers: "Because it's the only thing that keeps their foreskin from sliding up over their face." We're going to have a lot of these guys to deal with over the next period of time.

M: Could you speak to the production costs for establishing a Web site, and possibly give a rough line-item breakdown of where the money goes?

David Carlick: We're in competitive bids for the work that we do, and thankfully they're all getting more expensive as they go out of business or raise their prices. It's just a matter of hours, and so we learn it as we go along. A site like the Chrysler site, as we see it presently embodied, involves — outside of the brand management that was working on Chrysler — on the order of \$100,000 of time to bring the site up in this form, and about the typical \$3,000 a month to keep it running and keep it current.

We are currently suggesting to our clients that they budget more or less on whatever their budget is, assuming that budget is enough to accomplish reasonable things.

So you kind of do it half down and half for the rest of the year. In other words, if they're going to spend \$50,000 then we take \$25,000 to bring up the site, and then go to \$2,000 a month to keep it doing all the things it should be doing for the customers. Unless you have an automatic way that it is distributed to your customers, many companies in our business can simply use the Web directory as an 800 number, so that they're not concerned about driving

traffic to it. But if you are concerned about driving traffic, then the banners right now are selling on the order of 25 thousand per thousand.

You can buy the banners or work the banners and get on *Yahoo* and do it that way; there are some good companies doing that for a living. People are getting conversion rates from a tenth of a percent to a couple percent, which is just like direct response.

Andrew Jaffe: David, thank you for your time today.

ADVERTISING FORUM
LET'S GET REAL: CRAFTING MESSAGES THAT WORK
IN INTERACTIVE MEDIA



MODERATOR

Andrew Jaffe

Vice President/Executive Editor, Adweek Magazines

SPEAKERS

Adam Heneghan

Multimedia Director, Giant Step Productions

Eric Heneghan

Multimedia Director, Giant Step Productions

Andrew Jaffe: This is a bigger conference than we're used to running on this subject, but we still want to keep it informal. I hope some of you will join my panels as I create them. Our speakers are booked into two-hour blocks, but they really don't want to go on for two hours, so they're depending on us to form the content of their presentation by our questions during the second hour.

Matt — is Matt still there? Did those people pick up their messages or do you want me to read their names again? The other thing is that Matt Pollack, my associate there, put on your places an evaluation form. I wonder if this afternoon, you might fill it in what, give people ratings for their presentation, one to five, just so we have an idea how they sat with all of you. And then there's a couple of questions at the bottom. A little room for comments. If you're here for only one day, I'd appreciate you turning that in to Matt at the end of this session. If you're going to be with us tomorrow, you can keep your evaluation form. Put your name on it or not, if you feel like it, but we would like to know your title, the type of company you came from, so we know how different groups in the audience are reacting to this. We plan to do it, as I said, next year with Internet World and we want to make it as valuable as we can for all of you.

Our next two speakers participated in an earlier seminar that the 4-As, that I did in San Francisco, on crafting interactive messages that work. The Heneghan brothers — Adam has the sandy hair and Eric has a darker coloring. Otherwise, I think Eric tends to talk a bit more, but in this case, he may ask Adam to. He says this time, he's going to ask Adam to do more of the work.

Adam graduated from the University of Indiana, where he studied business. Eric went to the University of Iowa, where he studied English. In 1990, they decided to go into business together. Adam is 26 now and Eric is 28, so they were two years apart. I don't know whether I could've started a business with my brother, but maybe we have a lot to learn from them.

They started Giant Step Productions. Their first application was just a video. They claim it's the first video that's ever been done on a Mac. They made it for a wrestler who wanted one. With that money, they began working using computers to create training programs for John Deere and other clients, and then they migrated from that to doing marketing applications for Silicon Valley firms, including Radius.

In 1993, Leo Burnett suddenly woke up to interactive and digital marketing, and rather than trying to build a creative department from the ground up, if you will, internally, that did execute for their clients, they formed an exclusive alliance with Giant Step and asked the Heneghan brothers to move to their offices in Chicago and help them create applications for their client list, which as you know, is very impressive.

Since then, the brothers have created sites for Dewar's — these are Internet sites or other applications — Dewar's McDonald's, United, Marlboro and Oldsmobile, among others.

We heard from people today who know a lot about economic trends, technology trends. We just had a wonderful presentation by an excellent marketer who tried to explain branding to us.

But now we're getting down to people who actually do the work and know a lot about the creative issues involved in making these kinds of sites and other applications come alive.

With that introduction, I'd like to welcome back the Heneghan brothers.

Eric Heneghan: To clarify again, I'm Eric, the dimwitted one, but I'm also the better-looking one, so it paid off.

I'll give you a little more background about who we are and where we came from.

We started off in 1990. I wanted to be a film maker and my brother was doing graphic design, despite our majors. And we went to Mac World, right here in Boston, in 1990 to go see what people were doing with computers. We had grown up with them, and as they were evolving, I guess we kind of evolved with it. And we came to see specifically what kind of video tools were out there. And there was this crazy guy, whose name is Joe Sparks, and I'll do a little plug for him, since the game that he's been working on since 1990 just came out last week.

This is first guy that ever put an application on a CD-ROM, as far as for entertainment purposes. It was being used, at the time, to archive databases and everything, and this crazy guy put on this game — "interactive cinema," is what he was calling it — and it was called *Spaceship Warlock*, if anyone has ever seen it. We were immediately taken by this whole medium and excited by it. And he just came out with a game last week. I'll plug him again.

Five years he's been working on this thing. It's the most intense, interactive multimedia experience you'll ever see. It's called *Total Distortion*. I got an e-mail the other day from his company that it came out Friday.

Having seen that, we decided we wanted to start a company doing this. And, as I said, the first thing we did do was a videotape using traditional media, because nobody knew what we were talking about when we tried to sell our services. They scratched their heads when we told them about on-line services and the Internet, even though there was no graphically-used interface at the time; no browser for the WorldWide Web, but there were commercial on-line services.

And so we started doing a lot of this work, mainly for corporations — a lot of training stuff — and then started developing marketing materials for [inaudible] and graphic companies who still, even today, I think, are very much in the forefront. If there's any marketing to be learned or advertising to be learned from doing interactive multimedia, it is from all the [inaudible] and graphic firms, since they are not only creating the software and applications in the whole industry, but they've also been utilizing it longer and have done it in creative ways.

So, anyhow, what ended up happening is we ended up talking to several ad agencies within Chicago. We ended up moving to the city and ended up teamed up with Leo Burnett, who had a very intelligent marketing group — which I think is important for anybody that's trying to do this in advertising, to not only have the smart marketing people who are, first of all, willing to admit they don't know anything and then start to learn it, and who also have the intelligence of marketing and branding to bring to the party, which is something we knew nothing about and are just starting to learn about.

I'll give you a little definition as well as to what our strategy is at Leo Burnett, because it'll give a little framework as to why it is we are creating the things we're about to show you and where it is we think we're headed, and then we'll show you some examples and hope that after that, it'll open up some dialogue and we can talk about some of these things.

At Leo Burnett, we have pretty basic ideas of the strategy and marketing ideas. We try to break it down to its lowest form, because it can get complicated and in all the complication

and technology you don't get to the basic issues when you're talking to a client or selling any idea or doing any kind of marketing.

The first thing is that we recognize this new medium as the fourth revolution — you know, the fourth communication revolution, starting with print, then radio, then television. Now we're going to this fourth one. Like any other communication or form of communication, none of them have ever wiped out another one. Print is still around; we still have the printed page, magazines and books. In fact, we like to say that probably the people making the most money right now off interactive stuff is the press who writes the magazines and the books all about it and the conferences. They're the people making the money off it right now.

Basically, what we do after we recognized this fourth communication revolution is we like to break it down into what makes it different. And the biggest difference with this one is you're combining the other three mediums and adding interactivity. I know this is a pretty savvy group, so bear with me while I go through all this, but in the past we had to explain a lot of this stuff.

So, we'll go on to the next slide — or I should say, the next page, since we're doing the *Netscape*. It's better than *Persuasion*. And basically, for interactive marketing, what we've had to do for all our clients, as well as for ourselves, is give a definition. I think it's interesting that we all still define it, because we're all still struggling to define what this medium is. In its most basic form — and we still have stuck by this since day one — we define it as two-way, real-time, addressable communication combined with rich digital content.

What's interesting about that right now is these things, while they exist, don't necessarily exist together yet. It's not a cohesive thing that's converged, this two-way, real-time, addressable communication. The most obvious thing is commercial on-line services, as well as the excitement of the Internet and its growth and what it's doing; the rich digital content being CD-ROMs and floppies, because you can't really deliver over the bandwidth yet the kind of content or creative content that the CD-ROM can deliver, and vice versa — you can't have the two-way communication on the CD-ROM.

What we're really looking towards, and I think everybody is, even if you look at the new *Netscape 2.0*, is the point where those two converge. Having said that, it's an important point, because as we continue through this presentation we'll show you the other things we're doing on CD-ROM and why it's important not to ignore those and only be focused on the Internet right now. If you look at all signs of what deals are being made between Netscape and, let's say, Macromedia with *Director* and tools like that, with applets that are being created, like *Hot Java*, you're going to be able to deliver the CD-ROM kind of functionality once the bandwidth is there. And it's important to have those skills, not only creatively from a marketing standpoint but also from a production standpoint. And I think a lot of people are overlooking that right now.

A lot of people are specifically focusing on creating HTML pages and everything and overlooking working to become a very complex, confusing thing to create. So it's important to look at both sides of it. As I say, we all have our own way of defining it.

How is advertising primarily changing with this new medium and the way we're defining it? The way it's primarily changing — and this is the most basic way everybody talks about — it's push to pull, from an invitation to intrusion. The metaphor that we've come up with and have been using over and over and over — I think it still fits — is removing from a mass media communication standpoint from a true leader to the traveling salesman.

That's true that leaders in the past on television and more passive media will yell at a crowd. And it's a large crowd, and because of that you're a hundred yards away. We're yelling; the statement is very general, because it's a large group of people and we don't know who we're talking to. It's also simple for that very reason, and because you're intruding on people,

whereas if you're a traveling salesman you're talking to individuals, you're going door to door. It's a dialogue. It's not yelling and screaming at someone, just shouting one way, it's a conversation that happens. It's customized, because you're now talking to an individual and their needs might be different, and you can focus more on that. It's in-depth and it's also invitational as opposed to intrusive.

Moving on from that, we built this business model at Burnett, and the way we look at this medium is that there are two camps right now. That's starting to change and that's starting to meld, and I'm sure it will as time goes on. But there's the evolution versus revolution. We'd like to think of ourselves as the revolutionary part of Leo Burnett, which is kind of fun, because they let us get away with it. And they're kind of the evolutionary part that's trying to grow into this new medium.

And you hear these arguments all the time when you go to conferences, when you read *Wired*, when you go through *Hot Wired*, anything. There's these two camps that argue back and forth. There are those people who say it's just another media, and you have the revolutionaries yelling, "It's not media." Ad agencies that are capable versus ad agencies that are completely dead. It's a whole new kind of agency.

You hear that argument a lot, grafted-on versus rethinking everything. Clout matters versus sizes of disadvantage. Wait for the shake-out versus let's do it now, and central control versus anarchy. So as anarchists, we'll show you some of the things we've created within this evolutionary setting.

So, the first thing we're going to show is — since this is an Internet conference — a site that just went up recently that we did for Maytag. And one of the questions we all asked ourselves before doing it is, why Maytag? Why put them up on the Internet? To answer that question, I'll just tell you where it all started from. When we first got to Leo Burnett, the big hype among ad agencies was interactive television; that's all you heard about. Everybody was making deals, the Time Warner site was going to be up in no time, thousands of homes to millions in no time.

Those of you who are here from ad agencies, you know you were visited by every single little Baby Bell company or cable company telling you about these interactive TV sites that were going to be up in homes. I think the numbers right now should be in the millions, but I think it's still under a thousand.

Maytag was interested in getting involved in one of these, and we said — the way we've approached all interactive advertising that we do — we said, "Well, what is the marketing [problem] you're trying solve and then let's find a medium, if it fits at all."

And what they did want, one of the things they wanted to do was get involved with this medium as quickly as possible so they would have the learning and thinking of being a leader as opposed to a follower. And I think there's a big advantage to doing so. Not only do you learn things internally — and I'll talk a little bit more about that — but it's an essential part of doing advertising in this medium, because so much is no longer with the ad agency but also internally.

And the main reason for that is you now have this two-way dialogue happening and are these brands ready to give up that dialogue completely to the ad agency or do they still want to be part of that conversation? How do they handle it? Usually that means their customer service. So, for Maytag, what made sense was they wanted, basically, just to have their information out there in a digital form for people to be able to go access that. And nobody was kidding themselves that they were going to go there to be entertained; you're going there if you're looking for an appliance, whether you're building a home, whether you're a construction person or whether you're a consumer looking for something.

And also, one of the important things is to stay within brand character, which is why we work with the traditional creatives at the ad agency that work on these clients. So, some of the

things you'll see on the Home Page, "Old Lonely," who's obviously the brand character and "Home Dependability," which has always been the tag line for years that Burnett created. And some of the areas we have there are specifically for consumers, as well as people who are doing construction.

For instance, the product specs and remodeling is an area where they can go in and get specs if they are doing construction. And there's more information here than you would ever want to know about any appliance. Every piece of print, all the text, all the photographs, everything is up here, which is another important part, we think, to putting up any site. If you're a big company and people are looking for information, don't just put a page up that says "Under Construction" and it's going to be here soon. We didn't put this up. We worked on it for a month before it ever went up and we made sure it was complete, without the construction, and all the information was there.

Adam Heneghan: One of the things that we also try to do from a production standpoint is to try to keep all the graphics in a digital realm. We try to create them all digitally and have them so we can basically update the site very quickly and easily without having to go back and find the original illustrations and alter them that way. We just try to keep everything so that if a change needs to be made, we can make it that day and get it back up there. This is important to keep in mind with Web sites, because there is so much information, and you'll find that a lot of the information is going to be changing often. In addition to that, you may make a lot of mistakes just because of the sheer amount of information that's being put up there.

I mean, this represents every piece of printed material that Maytag has, and they worked on that for years before getting it out, so there really is a lot of information behind this site.

Eric Heneghan: We're going to spare you from every page, though.

Adam Heneghan: Now we'll move on to the next site. This is something that really makes sense for this client, because it's where their business is headed. You may have seen some of the other forms that they are already creating. The client — well, actually, before we go there, I very quickly want to click on some of these pictures and stuff. One thing I do want to mention before we push on is that the illustrations we use, from a technical aspect or creative issue, as you all know and are all painfully aware, depending on how you're hooked up to the Internet it can be very slow for the consumer.

The best thing you can do when the consumer is trying to get information — which, in my opinion, is what a lot of people are using the Internet for right now, to gather information — is that you want to do it in an attractive way. You want to do it in a way that speaks well for your brand. But I think you also want to do it in such a way that you don't frustrate them.

One reason we pick illustrations is we always try to shoot for the bottom-line consumer. More than likely, the most colors they're going to have is 256, you know, [inaudible] color. Illustrations look better in color, as opposed to putting photographs up. It might look great at your ad agency, but not great for the consumer out there. And it also makes it a much quicker download. The graphic files are smaller because we are trying to deal with fewer colors.

So, having said that, I want to move on to the next site, United Airlines. This client it obviously makes perfect sense for, where the digital media is going and for their business and what they're trying to do. United, in the future — and they already are testing this out on CompuServe, for those of you who are on a commercial on-line service, and it's about to go up on Microsoft Network.

They are starting a test doing reservations, mileage-plus, checking your flights. Basically, any information you'd want. And the speaker before this previously talked about the pains, I

think, not only for the consumer, where you call and are trying to get some information and you're put on hold and you have to wait for an operator. To be able to go get information right away — and businesses want that, I think, as much as anybody, and that they don't have to staff up to have people at the other end of the phone, they don't have to pay for the 800-number and having you input all the information. And in some cases, if you're on a commercial on-line service, making money off it, according to the deal you make with the commercial on-line service, as opposed to what you're paying them now.

Adam Heneghan: Again, not to interrupt you, but one of the other things that's interesting about this site, which we sort of initially agreed to and it became a bigger deal than we thought, was to have two versions of the site: one a high-bandwidth and one a low-bandwidth area. We can show you examples of both of those, but we ended up almost creating two sites, just because of agreeing to do that. And it was something we thought we had to do, because of people getting on an AOL and other browsers that are available now.

So, that's another thing to keep in mind, is if you are going to be working on these sites, it makes sense to develop the lowest common denominator and maybe do it across the board, as opposed to having two versions.

Eric Heneghan: To clarify that, for those of you who haven't been on the Internet using a commercial on-line service browser, if you're creating towards *Netscape* — which is something we try to do, as well as almost everybody else out there, because *Netscape* supposedly right now dominates 80% of the browser market. The commercial on-line services don't have the same kind of software written within them, so they don't format your pages correctly and they end up not looking the way you created them.

So, this is the "Friendly Sky" line that's been created.

And, again, working with the creatives at Leo Burnett, who work on the account, we stayed with the brand character, which is the employee-owners of United. You have a universal metaphor, since they are worldwide and fly around the world now. And you basically click on some of the employees, who are real employees, and who will be changing from time to time, probably every two weeks or month or so, and it takes you into that information.

Again, there's more information here. One thing we try to focus on the Internet with our clients is, I think, that really what people are using it for now is gathering information. At some point it will become entertaining, but for that medium right now a lot of people choose other types of media to be entertained. There are some things out there that are obviously very well done, and I think that's going to increase.

So, basically, I'll click in here and we'll show you the rest of the interface. There's a little slow connection here.

Staying within the interface with the employee-owners, those people on there become the icons throughout the rest of the site for what they represent, like "News from United." And they stay down the side as buttons linking you to the other areas, as well as within the hypertext, which is within the copy. And at the bottom of every page we also have some of the things that are under "News from United," the subcategories.

And we also have at the bottom of every single page the foreign destination or somewhere within the country that United flies to. It gives you a time for that city right now, as well as the latitude and longitude where that destination is.

We'll show you a little bit how the interface works when you do click on a subcategory. As you can see, at the top of the page, the "News from United" becomes not highlighted anymore and the press releases do let you near a subcategory. And you can jump back and forth. Like the Maytag site, we try to make it so you can go to any information you want from

anywhere within. You don't get lost as you head into subcategories. You don't get lost, trapped down there. You can basically find your way anywhere within the site for any information you want.

So, having shown both these sites — the cities at the bottom always come in randomly. Some of the other things we've got in there — we can try it, depending on how this connection works — is basically a database search, as well as a searching function. Adam, you might want to talk about that within the site.

Adam Heneghan: Initially, we designed this site for three stages in order to accommodate what United wanted to do right now, as well as let them grow into it as far as reservations and ticketing on-line. We developed some areas where you can do searches on flights, whether you know what city you're leaving from and arriving to. It'll bring back that information.

Unfortunately, those kinds of applications are still very difficult to do on the Internet. They require some high-level programming, and it's the type of thing that we hope to see become more prevalent on a lot of sites. But again, it is something that ends up being a lot bigger deal, especially with information changing so rapidly, like in United where their schedules change almost all the time.

Eric Heneghan: You also have a search feature at the top of the page for the site itself.

Adam Heneghan: I heard somebody mention Architext earlier, but there is [inaudible] using their search engine to do a complete search of the site. It's interesting, because they have a search engine that allows you to search, based on concept versus on just specific words, which is interesting. You can ask for the most comfortable seats or something and it'll find the most comfortable seats on the planes. It's pretty wild.

Eric Heneghan: Or any information, even its laundry, if it's doing dirty laundry. It'll basically rank them among what makes the most sense of what you were looking for based on that concept.

And the other problem with a big company like this is anytime you start to create stuff like this, it involves working with their IS department or anybody who's currently managing databases. In some of these companies, the databases are obviously just huge amounts of information there and they're changing constantly. That becomes a huge challenge.

Here's the search that will do concepts, as well as words.

M: [inaudible]

Eric Heneghan: Oh, no. This may not work. Oops. No, it said any information you submit will be insecure.

M: [inaudible]

Eric Heneghan: It's still looking, though. There we go. It found eight things.

Adam Heneghan: Also, it'll rate it based on —

Eric Heneghan: It rates the stars, see.

Adam Heneghan: Also, you can do a summary of the rest — oh, I'm sorry. You can also do a summary or you can summarize that page just by clicking on the "S." It'll give you a quick

summary of the page, which is nice. And you can also use that page to query the rest of the site, as an example, so anything else on the page would be similar to that one and would bring up and show you those pages, as well.

Eric Heneghan: Let's see what it came up with.

Adam Heneghan: "Roots."

Eric Heneghan: Did it? So this is the site that it took us to. And as you add more information — one of the other important things is that we're trying to create this in such a way — the Internet is obviously changing constantly. The tools are changing, your information as a company is going to change. So we try to build it in such a way that you can update that easily and keep adding to it as the tools change, as well as the information.

Now we're going to move on. We'll come back to more Internet stuff, but, as I mentioned earlier some of the things that we're also trying to do is continue on the course with some other media, like CD-ROMs and floppies, and I'll talk about how that's going to play on the Internet, especially with *Netscape 2.0*, which I don't know how many people here are familiar with. We'll get into a little of that. We'll show you some of the other examples that we have been doing: One is for Sony.

Adam Heneghan: And this is actually an interesting application. What we did initially — there was no way to do this across the Internet, and now with languages like VRML, which is Virtual Reality Media Language, it allows you to create 3-D objects on the Internet. They essentially developed the same application which we had to do on a floppy-based or a CD-ROM-based environment, and that's something that's becoming more compelling about using the Internet as a way of communicating. We'll show you that example.

Eric Heneghan: To give you a little history, the concept was created about two years ago and we started production on it about a year and a half ago. At the time, there weren't even CD-ROM drives out that [inaudible] put something on, so we wanted to do it on the floppy, as well as put it on the Internet on their Home Page and on commercial on-line services as a way to demo the Sony *Magic Link*, which some of you may have not seen, the personal digital assistant, kind of like the Apple *Newton*. And the concept behind the marketing problem was how do we demo this product that, at first, is only going to be used by earlier adopters — how you demo a product.

Basically, how do you demo a product that costs \$800? You're probably not going to build that many at first, even to demo to people. How do you get it across and let them try the product and see how it's different from other products out there? So, what we created was a virtual sampling which, in essence was a little, tiny file. We wanted it to be a quick demo. We kept it to 700K, which is fairly small, fits on a floppy, downloads fairly quickly and allows you to try the entire application — the entire hardware and application.

I want to hold the microphone near the speaker.

So, what basically happens here is you have an explanation at first of what the *Magic Link* is. A little intro. Sorry about this.

I'll try it one more time. For those of you who have seen this application, it just won — Communication Arts just had their first interactive contest, and it won the best interactive ad. Hopefully we'll get to see it. We basically created a 3-D model of the *Magic Link* that you can rotate 360 degrees any way you want and rotate it to any side, click on its sides, any of its features, its buttons, its hot spots, and it'll tell you exactly what the hot spot is.

We can't, unfortunately, show you the *Magic Link*, because of a little technical problem here. It's a brand-new *PowerBook*.

Basically, you rotate everything, click on any of the buttons in the hot spots and it will actually let you go into the application throughout the software, as well. It would be the same thing as going into the store and actually being able to sample the product.

M: [inaudible]

Eric Heneghan: Yes. It's on the Sony Home Page. If you go into "electronics," there's a *Magic Link* area there where you can download it. Once you actually click on it to zoom in, you can actually go try out the entire software. It's all hot. It either has the functionality of it or has an explanation. Why don't you go back to the desk, Adam, and see if things on the desk work just like they do [inaudible] the *Magic Link*, for those of you who have seen it, or are familiar with the product.

Since you couldn't actually see it within the application, let's see if we can launch it here. Because basically, it was a *QuickTime* movie that lets you access every single frame of it as you twirled it around. You had complete control over it. It's just a 3-D model. And, as Adam mentioned, in the future the way things are going — this is all built-in *Director*, by the way, which is something else that Netscape is building, is *Director* functionality and programs within *Netscape*, which is pretty exciting. It's in Version 2.0.

So, let's try one other one here and see if this works. Go to the Dewar's. This is something else that we did for Dewar's. This is a CD-ROM application that was put on what's called a [inaudible]. That's what they're calling them. I'm sure some of you have seen them. The one that we initially built it for was *Launch* magazine. What they're doing is putting their magazine anywhere, even bookshelves and computer software stores. They've started to become one and the same. *Launch*'s idea was to create kind of a *Rolling Stone* – *Spin*-type of magazine, where they actually go film an artist within the studio while they're recording, interview them and add those tidbits, as well as reviews and music you can hear and video clips that you can see. We're having it sponsored by advertising, so we did a Dewar's ad that is basically graffiti within their interface.

You can click on that billboard and it takes you into here. We have four different parts of the application. One is just the most obvious, a place to order merchandise, and since they have an on-line presence we'll be able to do it on-line. Right now it's an 800-number and order form that prints out. And we went along with the current print campaign, and the reason this was such a perfect application from a marketing standpoint is that Dewar's — if you seen the campaigns, especially in the Northeast, they're targeting people in 21 to 34, early adopters, kind of young, hip, trendy people, trying to get them to drink scotch since it has fallen into an older crowd. They're trying to make it exciting again; it's for young people.

So, we went along with the print campaign. We also took a traditional dog puzzle — I mean dog ad, sorry — and turned into one of those puzzles you get pissed off at and take a screwdriver to. We were thinking about building in some hidden keys that would turn it into a screwdriver, but... We have the time down at the bottom.

At some point they'll have an on-line presence. They'll be able to send the scores for a cap or T-shirt. We always hide things in the interface. You heard him when he clicked on the glass, it kind of jingled.

Now we'll try this one out and see if it works, because the *QuickTime* doesn't seem to be working on here. Let's see what happens.

So your taste in movies isn't all that's changed, and what we want to do is do like a bad B movie. At the time, the biggest thing on CD-ROM was *Myst*, and we wanted to try and play off its success — interactive cinema again. So, let's start it here and see if it works.

"Find the treasure bar and avoid the monster at all costs." So you're basically thrown into this 3-D city and you're running around trying to find the bar. You see the monster at the top. And the way you navigate is you can see at the bottom, it shows the directions you can go in. One thing that's interesting about this, is the media buy is done per megabyte, so you saw here the choice of going left or right. You decided to go right, and as a result of that we had to limit full-motion video and stuff because it was taking up too much space with the media buy. We did a bad move there.

"We regret to inform you you've been squashed like a bug; we invite you to try again." So we'll do the correct route here. If you look at his hand, he can go left or right. Show the left or right — well, you can go either direction and it shows you on the screen. See over here on the left, that building there is the Leo Burnett building which — we blew it up, actually, with the monsters. It's kind of fun. It's good on here. We'll just take you to the correct path to the tavern.

Basically, you're finally safe and you have a 360-degree bar you can navigate through here. These are the kinds of things that you'll be able to do, hopefully, sometime on the Internet as bandwidth increases. And the tools, like I said, are starting to get there. We have a lot of fun with it, but it is also the whole new level of doing things. That bar, for instance, is a 3-D model we created. For those of you who know anything about building 3-D models, it's actually made up of 2400 different 3-D models within there. Everything down from screws to nuts and everything else.

So, that's an idea of some of the stuff we're doing on CD-ROM. And like I said, we encourage everybody to keep playing at both these medias, because they are converging more and more.

Netscape 2.0, and I briefly touched on it, has just come out. It's the new browser, and they're building in plug-ins. I don't know if this means anything to anybody, but what that's going to allow you to do is other people out there, like people who created *Director* — which is how we created those other two ads — or people like *Java* are creating basically a language, so you can write these plug-ins. And what plug-ins are going to allow you to do is have some other creative person out there, while Netscape's worrying about making a browser that works, creating new applications nobody's thought of yet. They've created an open architecture or language that is open for anybody to go create anything they can think of, and add that functionality within *Netscape*. That's a pretty exciting thing.

For those of you who know something about the graphics world, *Kai's Power Tools*. Those are plug-ins written for *PhotoShop* who — he's added a whole new kind of graphic element to *PhotoShop* just by being able to do that. You know *Hot Java*, which everybody keeps talking about, is being built into that for those kinds of browsers.

Well, having said that, we're going to go to two more examples very quickly. I just want to go to America Online first. The reason I want to show these examples — and one is an on-line service and the other is a CD-ROM-based product that's going to be coming out early next year — is the branding across different types of distribution; one being the on-line services, the CD-ROM, and also, we have an Internet example, showing you those three and how the branding can work across all those different types of distribution.

We'll start with America Online here. I'll show you some of the other things we're doing for clients. It's interesting, too, because everybody is also targeting towards Internet now and not maybe looking at — that a commercial on-line service might make sense for certain clients, depending who they are and what their marketing objective is. Two of the clients that

we've put on there, McDonald's and Oldsmobile, we'll show you. And we're doing things across all the different media. Probably the client that has done the most of that is Oldsmobile.

The first thing we'll show you is something we're currently doing for McDonald's. Their marketing objective was to start playing in this realm, and the commercial on-line service seemed similar to where they wanted to be. It's already kind of a community. Some of the ways we like to describe on-line services of the Internet is the on-line services are the nice, neat suburbs — and the Internet is the big, bad city. It is interesting, because they can have advertising right at the front, they buy media. Somebody else is in control. They have a lot more control over the content being on there.

We're having all kinds of problems here.

So, with McDonald's, what's interesting for them — and these are some of the issues a lot of clients are having — is all of a sudden you're having a two-way communication happening. How comfortable are clients in this new world? Right now, they're not very comfortable. The Oldsmobile example we'll show you, for those of you who have seen it, it is interesting in that they've opened up communication lines, which is where this world is going. McDonald's, who's been sued for spilled coffee or anything else, obviously is not as comfortable with this new medium and opening up those lines of communication. And, like any big company — and I think it's true of anybody — they are staffing up to be able to handle that demand, whether it be customer service issues or anything like that.

I think it's very frustrating for a consumer to go into an area that you're accustomed to and then having that two-way communication happening, going into a big market and not being allowed to do that, but only be able to just go through information. There's nothing more frustrating than having a place a company says you can send e-mail and not hearing anything back. I think people like that miss the point. So McDonald's created for parents to go in since McDonald's feels that it is a family place and a place where a lot of families visit.

It's also part of a direct-mail campaign that's been very successful for them called "McMoms," and the concept behind it is just to create a place where parents can go. And they're not asking for anything; it's not a big sell, it's just working to build that, to enhance that relationship with those families. It's a place where parents can go talk to other parents, leave tips and information. They also have experts on there all during the week about parenting and raising issues like that and being able to talk to the consumer.

Adam Heneghan: The other thing, as well, is that this is also done on the Microsoft Network, so it's both on America Online and the Microsoft Network. Again, because all the art was created in-house, we kept that in mind, and when the illustrator gave it to us, we were able to disseminate it to both Microsoft and to America Online.

M: [inaudible]

Eric Heneghan: The other client that we'll show you on here — and I'll just get into that so we don't have to wait any longer — is Oldsmobile. If not, we'll just push on. The other one that I'll talk about very quickly is to give you a little brief example of Oldsmobile.

What we created for them was a site where they really are opening up the floodgate. They've created a message board where anybody can go in and say anything they want about their products; and probably the reason they did that is we were able to show them that these conversation areas are already happening. They can either join the conversation or let it happen.

These automobile conversations were already on-line. The Internet already has a forum where you can go talk about these things. You can either be in there standing up for your brand

and standing up for your products or you can just [inaudible], and so they've actually created a message board where they have people who are managing it. They get back to you probably within six hours at the most. If you're having a problem with your car, they get back to you and tell you how to fix it — they work to fix it for you. Everybody has seen this publicly, as well.

I think that in the past a lot of the American car companies had a bad perception of not caring about the customers and not giving them the kind of service they needed. This is one way for them to show them, as well as showing that they have moved into this new world and that they are technically savvy.

In the marketplace and in the commercial on-line services they always have highlighted things. In some cases it is Oldsmobile, in some cases McDonald's. The other thing we did in the past with Oldsmobile, in order to drive traffic through there from an entertainment standpoint — whether it was car companies or whoever it was, the advertising was creating the soaps and the Miss America show, and a lot of the entertainment that was on there — we created an area called "Celebrity Circle," at a time where people weren't really having celebrities on there. And basically it's "The Tonight Show." Every single weeknight we have a celebrity on there that you can go talk to for two hours.

I wonder if McDonald's is down there, "McFamily?" Oh, you know what? Don't do it.

This is basically the AOL site. The interface are the windows, the different parts of the family. I want to just go into one of the chat areas like "Craft Ideas" over on the right. It's just an area where several ideas are being shared by other parents. You can click on the buttons to bring up the different subjects, as well as go to a message board down in the right corner. They will take you to "Craft Ideas" and "Shared Thoughts" down there. Down below. You can send a tip to the editor.

One thing they wanted to do, since they didn't feel comfortable just opening up the message board, is treat this like a letter to the editor. The best ones are posted up there for everybody to read, and here's some examples that mothers have sent in of craft ideas. There's also an area on here where we can find out what the Happy Meal is and sell marketing information like that, as well as customer service relations where you can go talk to them about any concerns you might have.

Having said that, we'll go to Oldsmobile.

M: [inaudible]

Eric Heneghan: Yes. That was one thing that was the most interesting; the first time we ever put McDonald's up there was [inaudible] area, and it actually was one of the most highly-visited sites.

This, for instance, is Oldsmobile. I don't have the exact numbers and I don't think I'm allowed to give them out, but I can tell you that for Oldsmobile, night is the most popular time in what they're considering prime-time hours. Part of the reason is the "Celebrity Circle." McDonald's, too. It's pretty shocking. People are attracted to brands, which wasn't something we were sure about on on-line service. They definitely are.

[Tape change]

Eric Heneghan: So, here you see tonight Monday's "Celebrity Circle" — Jennifer Grey, whoever that is. Must be a director or something; I guess I'm too young, I don't know. So, there's "Celebrity Circle." There's transcripts here. We can read past transcripts of past stars, as well as photos.

But the part I wanted to show you that I think is the most interesting — besides the Oldsmobile showroom where you can go find out about any of the cars and see pictures of the interiors, the exteriors, how the cars work — is that you can download articles from *Car and Driver*, *Road and Track*, everything that's out there about their cars.

We'll go to "Olds Tack" here which, like I say, is one of the gutsiest things I've seen a marketer do on-line, whether it be the Internet or a commercial on-line service.

Does anybody have any questions about any of this?

M: [inaudible]

Eric Heneghan: It's always very interesting with any of these clients, because they're all so different, who you talk to. With Oldsmobile, for those of you who know who he is, [John Rock], who's the head of the company, actually came to a meeting. And in the first minute I don't think he had any idea what we were talking about. He picked it up within 15 minutes and the next thing I know he ended the meeting and said, "Let's go do it; why are we sitting around?" And that doesn't happen too often. He was very trusting about the whole thing, and I think that it's shown him it's paid off for them.

There are some interesting things in here, like a brochure. They can figure out right away if they want to send it to you or not by asking you questions. They're having you fill it out. They don't have to have the phones manned, like we discussed earlier. And I think it's paying off in even their image, and they're on there answering any questions and fixing any problems people have.

M: Another question: some people have complained about working with America Online, that they have so many limitations in what you can do.

Adam Heneghan: The most frustrating thing for me with working a commercial on-line service is that they don't give you any tools to go create these areas yourself. They're starting to. And there's nothing more frustrating than handing something off to somebody and having them tell you it's going to take so many months to go put this site up. I find it hard to believe it takes that long, for one thing, because in what you're doing you have limited graphics and everything. And not being able to have control over it yourself, I guess, is the most frustrating thing. You're having to depend on them.

Where they are starting to build tools, Microsoft Network, for those of you who are playing with that, has built a great tool called *BlackBird* to create areas within their site. It's pretty simple to use. It's coming out, I guess, the first quarter, it'll be available to people. We've been playing with it and it's fairly impressive for creating your own areas. And a lot of limitations, I think — it's a concern we have. We're the biggest advocates of the stuff.

We're incredibly excited about all of it, but a lot of the stuff is being so oversold. I think it's not only in the media but by people trying to sell the product and everything else that by the time the consumer, who's just reading about the stuff or just hearing it in the advertising, goes on there, I think if it's oversold you're going to disappoint them. If you just manage expectations, it's a pretty amazing thing.

M: [inaudible]

Eric Heneghan: That's where your media buyer comes in and that's where we've found it [inaudible] that is where some of these big companies come into importance, and if you have

savvy media people or even a client that can say, "Look what I'm bringing to you..." A lot of the deals I've seen actually get a cut of whatever money is spent in your area.

Why don't you go into one of these questions, Adam, why don't we just go to Olds "Aurora" here? And this is just some mail that people have put up there. "Hey, Olds, how about" — what's it say? Message in the Northstar, I mean, the Aurora engine 4 or 6-liter, stuff like this. People who go on there start arguing about foreign and domestic cars and when you have people standing up for your own product... Jim didn't blow it. Here's somebody standing up for the car. Somebody wrote something about it. "It is the tip of the iceberg. Look out. Here comes the new Oldsmobile." And you have consumers standing up for you like that, and the people who work for Oldsmobile are posting messages clearly saying that that's what they're doing.

So having shown the Oldsmobile area on America Online, we'll show you what we're doing for them cross-platform. We're doing stuff on CD-ROM, as well as an Internet site for them. The CD-ROM, the concept behind that — and we decided to do all these things at once when the initiative was launched. The CD-ROM was taking that Sony *Magic Link*, basically, and doing it with every single car. You can rotate the car, click on it to find the features about it and get the information you want about it.

And the CD-ROM is being placed on a program for mapping that we found already existed that didn't use the whole CD-ROM. They basically map all around the country, and it's going to be given to anybody who's a good customer or as an incentive to test-drive the car.

And, again, this is all in progress. Yeah, this is something that is being created. It's not actually done yet. They were nice enough to let us show it.

Those of you who are coming from ad agencies, that movie right there was actually just created by the art director who — it's his voice and everything and, obviously, we'll put in the real voice later. But he did just sit down at his computer and just decided to edit that in a way they probably would never get to at other times.

As opposed to going into a post house, he was given the software and he was able to edit it.

M: [inaudible]

Eric Heneghan: That's coming on the hard drive right now, but we're shooting for anyone with 180K.

What Adam's doing right now is he's navigating to the car. As you can see, he's actually — it's like *QuickTime VR*, basically, the software they wrote for the Sony *Magic Link*. And it also changes the big picture up above. You might ask, why are you doing that? The reason we have to do that is to rotate a big picture like that, a computer can't really handle it right now, so we're doing it with a small [inaudible]. And then when you go up to the big one, it actually has hot spots at the trunk, for instance. Click on and read about that. We'll do the engine and the interior, just to give you an idea.

So, we're also creating an Internet site for them. And that's basically some examples we just wanted to show you and hopefully that's opened up some questions you might have about any of it.

M: I have one question. I work for a bank and don't have anything quite as sexy to show as the Aurora; maybe something about as sexy as a Maytag washer, but one thing I'm interested in is that when you think of multimedia and interactivity, you think of something jazzy like that. What have you found in terms of copy treatment on-line or interactive? How has that changed from the traditional media?

Adam Heneghan: There was actually a great comment made... If we go to the Voyager site, which is on the Internet, there's actually a great essay a guy wrote about how we've thrown typography back about a thousand years by going on-line. Some of the things, I've actually see some software. Right now it's obviously awful, because the screens are unable to recreate some of it the way it should work. It is what [inaudible] what a printer does for us is it turn into Postscript and smooth out those fonts and everything, and this is done for us.

So what we're having to do a lot is create graphics, not treating the text as real type that's being downloaded in real-time, but more as a graphic that's being downloaded. The problem is that slows it down for the user. That's some of the ways around it. The other thing is being able to pick good fonts.

There are people out there designing fonts specifically for the screen that hopefully will improve that. Some of the other issues that I've actually seen is Microsoft is working on some software to work with their *BlackBird* that will actually create kind of a postscript within Microsoft Network to their type, and that'll come out in the first quarter. That is a huge problem a lot of people have, to answer your question.

M: [inaudible]

Adam Heneghan: By the way it's written? I think there's been a lot of studies done. The reading off the screen is not a very pleasant experience and most people tend not to. I think that'll improve as screens improve. Some of the things you guys may or may not have heard about is Bill Gates and these screens he's building that supposedly exist in his house.

They have all kinds of things, like a retinal scan, so they can see where you're reading and it'll move the page according to where you're reading so it looks like it's — you know, perfectly stays within your eye. And these screens also display artwork when they're not being used as television screens or computer screens. That's why he's buying up all the great artwork in the world, so he can display it almost as a screen-saver within a frame. So, I mean, those are some of the technologies that'll advance.

But, I think there's a lot less copy written, to be honest with you. I'm not sure how many people actually read on there. I do think there is a place where you want information like that. And the biggest thing about the copy is now you're able to navigate through it much more easily and the hypertext adds a whole new element to copy. I think that's an amazing thing, to have text back in the text, if someone wants it. It's kind of an exciting thing.

M: I just got asked this question: How many hits does the Maytag site get? Do you have an idea of how many people are...?

Adam Heneghan: The reason it'll get hits — and, I mean, everybody planned on it and planned how it was going to work — is that it's tied into all their print material as well as television stuff. They're going to start putting that address on there, so that if you are in the market for buying something... It just so happens I'd bought my first place and was looking for appliances when we were building it, so there's actually stuff there that I know nothing about. But everybody knows that's who's going to be hitting it. It's only been up for about a week and a half now, so I can't tell you what — we do have some software written that tracks that, tracks how many people are hitting it. But I don't have those figures yet.

M: Could you repeat the name of that context-sensitive search engine that was at United?

Adam Heneghan: The name of the company, I believe, is called Architext, and the name of the product is *On Target*; at least, that's the name of the beta release. I think, it's still beta. It's being used for *Hot Wired*. It's also under the Net Search button and *Netscape*, so...

M: [inaudible]

Adam Heneghan: We have built some message boards and United is intending on putting them there for talk about travel. The biggest concerns for any big company like this when you start to deal with it — that's one thing that's probably most frustrating, dealing with small companies like Silicon Valley companies, but you can understand their hesitancy to dive right in there. It's just the legal ramifications of having open message boards out there and having any kind of communication like that. But United is planning on doing that.

M: [inaudible]

Adam Heneghan: We've actually built several. The one that we built for United is just basically like a message board, similar to *Hot Wired*'s, some threads, and it'll probably be used for talk about travel. For most clients, I guess today there's just a hesitancy. Oldsmobile for sure will add that to their site when it goes up. That's still being developed. But it works so well for the commercial on-line service for them.

And there also are companies out there who are working on real-time chats for building a community. We've seen it and we've played with it. We haven't actually developed anything like that ourselves. Right now it seems to be a fairly difficult thing to navigate and also requires you to keep loading the page in order to keep pushing the information through. But, I know what you mean, and that's definitely something that I think everybody's looking into, is a way to grab a little bit more community-based feeling, like the on-line services would be.

M: [inaudible]

Adam Heneghan: The two examples that we showed: One, Maytag is actually being served [inaudible] and the other is United, which is going to be served by United through their [inaudible] department.

The other thing I'll mention about United, since I did about Oldsmobile, is that's something that's a work-in-progress too, and they were nice enough to let us show it. It's not actually up there yet. It will be soon, within the next two weeks or so.

Any other questions?

M: How does Giant Step Productions function within Leo Burnett? Do you have to sell your services to your clients or is it more of a function of when the account teams and planning, they might stop and think, "Oh, yeah, we should do something with interactive"? How is that working?

Adam Heneghan: It's actually really interesting, and we change our model about every week, just because the stuff changes so much. Within our group — we're part of a group called the Interactive Marketing Group at Leo Burnett. Some of you may have not heard of [Rashad Tobakawalla] who leads the group. He talks at a lot of these seminars and is thought of as a visionary in this stuff. And what he does, he sits with the lead teams on every client and any time they're discussing about next year's advertising or a certain campaign they're trying to do,

and we try to stay on top of what's going on within the agency — keeping in mind that if there's something there that we do that could help and provide a solution to that marketing objective.

So he stays on top of that kind of stuff, as well as we all keep our eyes and ears open and make everybody within the agency aware of what we're doing. But you also don't want to do that too much. You know, I heard earlier, the gentleman before us was talking about having these meetings where 30 people all of a sudden show up. Everybody wants to be involved because it's the new hot thing. And we like to call those the “thundering herds,” and it's just the kiss of death, everybody getting their finger in there. It just slows everything down. You know what it's like when everybody's in charge of it. So we try to [inaudible] to a few key people and people who are capable of making decisions, not people who have to go get permission somewhere. That's one of the ways.

We usually end up with a mainline creative and sort of a mainline account person that pushes these projects through.

M: [inaudible]

Adam Heneghan: The question was, how many people do we have working within our interactive creative group? And also, you wanted to know the length of time to create a site or some of these ads?

M: How often are you updating these sites?

Adam Heneghan: Okay, real quick; just as far as the updating goes, it depends what you mean by updating. As far as changing the whole look and feel of the site, obviously that doesn't happen very often, but small changes will be done immediately, and they happen daily.

We're adding new stuff to the areas, and we have deals with that [inaudible] we keep that in mind and the people on staff are constantly adding. Another interesting thing about this is you're introducing clients to a whole new medium — everybody's trying to figure out this whole new medium. New tools become available and the client's heard about this, or this has given me an idea to do this, and you have to be ready to keep adding those things and that's part of the Internet.

And now I'll try to answer your question about the creative people. In Giant Step alone, we only have five people doing all the production. And then we work with the traditional creatives, and usually they become guidance for us to be able to go to and make sure we're staying within brand.

M: [inaudible]

Adam Heneghan: How do we signal what?

M: [inaudible]

Adam Heneghan: Oh, for anybody going on there? We don't actually have any time limits. Anybody can go on as long as they want.

M: [inaudible]

Adam Heneghan: Everything we're doing right now — and one reason you don't see a lot of that up there right now is that we're trying to build it the smart way, as opposed to doing

something real quick like a flat file or something like that. We're trying to create everything so it's automated into those companies' networks right now, the way they're doing business.

So, as an example, at United, they have a press release. The normal route the press release takes before it gets out to being an actually printed piece — this will be one of the links in that way, so the press release will be typed in and it will automatically be updated on the server and go ahead and be printed at almost the same time, so everything should be timely.

We're trying to link into things like, for instance, reservations. The Apollo system is what we're working on right now, so that information probably already exists out there. For those companies that it doesn't exist, we're trying to encourage them to build systems that do offer that.

M: [inaudible]

Adam Heneghan: Usually it involves — right at the very beginning we have discussion. Are you saying like when the user comes on, is there a date stamp at the bottom? No, there isn't. And we're trying to get into a situation where there is never a situation where you'd have information that's outdated. And that's how we're setting the sites up to make sure that the information is timely. It doesn't make a lot of sense for United to be up there with information on their flights of last year, so we try to keep that up, so that it's not an issue.

M: I'd like to hear your thoughts on advertisers advertising on-line, advertising their Web sites using banners on other services. And if you were to give a recommendation to Oldsmobile, would you head up their Internet site, their Web site? What percent of the development cost should go towards the creative and maintenance and what percent should go towards promoting the site?

Adam Heneghan: I think that obviously that is a decision that would have to do with the media people, but definitely for certain things you're going to want to drive traffic to it and I'm not so sure people — it depends what the objective of your site is. If it's to get people excited about a product, like the Maytag thing, I think it makes more sense if someone's in the market for an appliance or going to go find it as opposed to putting a banner somewhere. For Oldsmobile it probably would make sense to have a banner somewhere and somewhere that gets a lot of traffic.

And, you know, those places right now are actually kind of clear-cut who to go to. You have your *Hot Wired*, you have your ESPN *SportsZone*, you have places like that, and there are some really well-done magazines like that right now that people are hitting for fun.

One of the ones that's the most interesting to me is *The Spot*. Have any of you seen that? It's kind of like a "Melrose Place" diary that's going on on-line, an MTV "Real World" kind of thing. And when we first discovered it we were scratching our heads, very skeptical I guess, being the Generation-Xers we are or whatever they call us. This was not real. And there's this whole diary going on with these six incredibly gorgeous people who live in this house in L.P., and have these incredible lives and you read their journal every day with these pictures of everybody they're meeting and hanging out with and sure enough, it turns out it's an ad agency in L.P. that's creating the site. And they've spent, I think, \$600,000 so far. It's only been up for about four months, but they're still trying to figure out how it is they're going to work advertising into it. They're getting everybody hooked first, so it's kind of interesting. I'm sure they'll add banners or something at some point.

M: Do you have any problems or have you had any problems that you've had to deal with the legal people at Burnett, like Carla, on advertising liquor on the Internet?

Adam Heneghan: Yeah. Dewar's is not on the Internet right now. But the name that he brings up is actually an interesting part of our group. The Interactive Marketing Group that I mentioned is made up of people with disciplines from across the agency. We have some media people, so they can give their guidance and advice from [inaudible] they come from, creatives and legal. And the legal person we deal with is [Carla Micolotti], who's second in command at Leo Burnett in the legal department, and she was actually one of the first people out there that went and met with Al Gore's people when nobody was addressing even advertiser's rights in this new world.

So many people are trying to — the government, too — trying to decide how this is all going to work, who's going to control it. And there are so many legal issues that come into it with copyright laws or even some of the things we mentioned earlier about things that are happening in foreign places.

In the case of, like, Philip Morris — who's one of our clients — and McDonald's, they had offices in other countries that were trying to do Web sites. And the problem is you have to make those people aware that when you're doing it in Amsterdam, you're also doing it in the United States. You know, it's going worldwide.

And so those are issues that I think everybody is trying to define right now. They're not defined yet, but she is in on those conversations constantly.

M: Totally different question: Is part of your charge to do anything in the way of training, either informal or formal, to the more traditional creative people in the agency, how to do this stuff?

Adam Heneghan: When we first got there, we did a lot of that. It's actually an interesting question. It's something we struggle with all the time. In some cases, I don't know if it's a best benefit to do that. You might take traditional people and now you have to... Part of the advantage we had is we had two years to really sit down with this stuff and play with it as toys, and we were fortunate enough to find somebody to give us the funding to go buy all this equipment and get good at using it. We had client projects here and there, but really, we were in [inaudible] City. That's where we started our company, so there was not much distraction. And we sat up there and holed up, learning how to use this stuff.

And that's one problem; we tried [inaudible]. I think a lot of them can pick up on it and everything, but as far as do you really want them in there trying to learn all these tools, is that the best money, or the best money spent on your creatives? Should they be doing that or should they be coming up more with the brand and the concepts and trying to understanding the medium overall, generally, to be able to assist you. I think that's probably the better answer.

Any other questions?

M: How do you get paid? Do you get paid by the hour? Do you get a retainer? How do you like it with a client to get paid? Do you make a commitment for six months or what?

Adam Heneghan: For the Internet? Well, I mean, some of those ones, like the CD-ROM stuff, what's interesting about that is once it's done and it's pressed, it's gone. And for that we work out how much time it's going to take. I don't know how the agency fees work. I can only speak from a production standpoint, or at least I'll plead ignorance to it. But basically we figure out how long it's going to take us from a production standpoint, as graphic designers and that kind of stuff, and figure out a fee for that and come within the price estimate.

Or in the case of the Internet or something like that, we have to figure out how much time they're going to have us keep updating, keeping it timely, adding things as the tools that are around. So for that we figure out a fee for how much it's going to cost per month to change that. And that's based on so many hours. Everything's based on hourly fees.

M: My last question is, do you think that the playing field has been leveled? Is there some advantage working doing your job at Leo Burnett or could you go around the corner and do it with Elite Partnership tomorrow and really achieve the same goals as you're achieving?

Eric Heneghan: It's an interesting question. What it leads to is an added benefit. I definitely do believe there's an added benefit to doing it with traditional creatives, traditional marketing minds, traditional media people. Everything with an agency, I definitely see the added benefit. The place where it causes concern is [where you ask] is that added benefit worth the difference in cost from going somewhere like, I don't know — Five Guys in a Loft, we'll call them. There's definitely a difference there. And then you have to judge what that value is, and I think what agencies need to do is realize this is also a different medium and maybe price some of that differently, to give people who aren't paid [inaudible].

Because you have such overhead. The whole model is set up to work with television and print, which is an entirely different model than this. So as far as the economics that come into it, actually the biggest issue is that I do think there's an added value and I think the reason the big agencies now have the big clients is that very reason. It really leveled the playing field, not only for interactive stuff but even the television, print — I mean, in the past, you used to have ungodly amounts of money and access to resources, be able to do post-production or anything like that, and computers have really leveled the playing field across the board for all mediums. And if you have a good idea, it's not that expensive to execute it anymore.

Andrew Jaffe: Adam?

Adam Heneghan: Well, the one thing I will say is that from a development standpoint, it certainly is. The Internet is much different at a cost point, I should say, to the client than is a CD-ROM development. The things that we've been sort of struggling with are not so much the programming, not so much the graphics we're creating, but it comes down to an issue of organization and of gathering all the information. That's really where most of our time is spent in developing a Web site. Lots of times in CD-ROM we'll be writing code or creating the images, things like that. So, it's sort of a different cost than it is, and it's a lot cheaper to do, even from a production standpoint, on the Internet. And that certainly has leveled the playing field. You really need a computer and a connection and then you're off and running.

They are converging, both those things. That's what's exciting about it.

Andrew Jaffe: Okay, folks. You've been a great audience, those of you who've stayed the route. We'll start tomorrow morning at 10:30 with G.M. O'Connell from Modem Media.

Adam and Eric, thank you very much for a wonderful, rich presentation.

If you are leaving tonight and not coming back tomorrow, please leave your evaluation forms with Matt Pollack, my associate there, who'll be at the door.

ADVERTISING FORUM
HOW DO YOU GET CONSUMERS TO REVISIT A SITE OVER AND OVER?
A CASE HISTORY: ZIMA CLEAR MALT BEVERAGE



MODERATOR
Andrew Jaffe
VP/Executive Editor, ADWEEK Magazines

SPEAKER
G.M. O'Connell
Partner, Modem Media

Andrew Jaffe: G.M. O'Connell got out of Middlebury College in Connecticut and decided to go skiing in Vermont, and then decided to go skiing in Aspen, and that is probably a central point to his going digital. So some of you may want to consider Aspen and skiing in your own training. At age 24, he joined CompuCard and was the product manager of the first electronic shopping mall.

In 1987 he decided to form Modem Media. In those days, as you know, digital media really didn't exist to any degree and a lot [of] his early days were [spent] trying to explain to companies what this would be and get them to fund pilot projects. Today, the company is billing about the level of a hundred million and it's got 85 employees. I think *Adweek*, in its articles, has considered it one of the two or three leading digital marketing communications companies in the United States. Its clients include AT&T, Delta, MasterCard and Coors, and we'll be discussing, among other things, the Zima site that Modem Media created for Coors.

There's a lot of call on G.M.'s time — he's got to run the company, he's got to take care of clients, and we're all fighting to get him to speak and train the rest of us, which he's been very generous in doing, he and his associates. With great pleasure, I present G.M. O'Connell.

G.M. O'Connell: Thank you very much, Andrew. It's great to be in Boston in October, and if you're a Red Sox fan, this October my heart goes out to you once again, and I promise I will not make any Bill Buckner jokes. It's great to say that as a Yankee fan.

I think the name of this Web, or the working title, I believe, of the presentation is, "How Do You Get People to Come Back to Your Web Site Time and Time Again?" I'm glad that you all came to this session today, and I hope that you will stay awake and stay awake and stay awake throughout this two hours of my being here. What I want to go through today is one of the attributes of the Worldwide Web and digital communication in general, and why do I as a marketer care. We've taken a look at some of the functionality of the Worldwide Web recently and there's still something that we as an agency are trying to get our hands on — certainly no one has all the answers, and we do not claim to, but we've started to break out the different attributes or functionalities that define how we use the Web as a communications tool in different zones.

I want to take you through those zones so you can better understand what we're attempting to do with the Zima brand, and I think we'll have a long period for Q&A at the end, right Andrew? The key mission... I don't know how many of you saw this in the *Sunday Times* last week, this gentleman's name is Lawrence M. Crowse, he's a physicist at [inaudible] & Reserve in Ohio, and his specialty is trying to figure out which *Star Trek* technology will actually come true.

And [inaudible] to go with Zima, he says if you look at the way bandwidth is exploding and computing power is exploding, by the year 2200 you will be able to actually do the transforming — transporter technology.

That's our idea of saying once digital communications really happens we will, working with this gentleman, be able to transport Zima electronically. But until we're able to do that, we've really got to focus on doing marketing on Zima, not delivering it.

Andrew did a great job talking about Modem. We were the first agency out there, and one of the biggest today. We don't just exclusively focus on digital or on World-Wide Web applications. In fact in Zima we used a lot of telephone voice response — and I have a big project going with AOL that I'm not going to talk about — but through the years we've been able to work with clients to do over 200 campaigns on six different platforms from voice up to virtual reality. What really matters, and I think that this is what many agencies and many marketing communication companies need to focus on as we leave this century, is designing and creating and managing interactive relationships between people and brands. And that's really what I'm here to talk about today.

I'm not really here to talk about Internet growth except to say that we have all probably been reading the press articles and it's "hockey stick [growth curves]." We'll come back to this as we explore Zima in some of the psychographics, but we're not as concerned on the Web right now about demographics as we are about psychographics. The typical user is an information seeker who will use his technology to better control and manage his time — as Dave talked about yesterday, and I think he is pretty dead on — they're early adopters and they're very much opinion leaders.

Technology has become something of a badge value [inaudible]. *Wired* magazine has identified as a visionary, and that's very true. Three years ago you were a geek; now everybody wants to use you to get themselves on the Internet. So if you fit in that category you are a mentor-in-waiting, and that's something that we really want to capitalize on. The people who use the Web, use the medium to really enhance their lives, as I mentioned, and they really [inaudible] as a transportation medium, as a way of really getting from one place to another, being able to go at a click from one place to another.

Now, why did we get involved? And why should any market really get involved? First of all you've got to look at the numbers. If you want to have relationships between brands and your customers, you got to go to where your customer is, and that may be on the Internet right now. More importantly, we try to create a place where a brand and the people can meet and provide a context for that, worlds for that, zones for that, as we'll see. Retention recall is much higher when you interact with messages and ways to save money — we'll see some of those.

What is it really all about? Well, it's really all about control and manipulation of digital files in real-time. That may be by the targeting, by the customer pulling those files, where they are in control of getting what they want in terms of information and entertainment, and the advertiser or marketer pushing and trying to anticipate the needs of the user and pushing files, which may be sound files, textural files, graphical files, video files — it doesn't matter, parts is parts, bytes are bytes.

When we can get a handle on this we begin to understand how to create innovative and very personalized communication. But more and more, this is really not about technology, and I'm sure as you're finding out, it's really about MIS guys becoming creative directors. Really what it's about is people. And it is really the WorldWide Web. It's really a new dial tone. It's an open system.

Anybody can connect and a lot of people are sort of chanting that mantra right now. But for me, when we decided that we were going to get Zima involved on the Web — it was actually before this time last year, when nobody else was really there — a few technology companies were there, and we started taking a look at how it was really being used by people, not by companies, and we came across this: I still love this; this is a birth announcement, the

first one I ever ran across, and there's a lot of those up there right now, but this one is by a guy called Brandon. That's his kid, that's his wife. Brandon is here in the audience. I never met this guy, but I'll get to meet him later. This is what it's all about, folks.

It's also about wacky things like UFO pages, and we showed this to the brand and we said, "We don't know exactly what this means, but we know that you can create a world that you get to control and the users can also participate in." This is the UFO Home Page, and I like this one, and this is one of the original ones — this thing has been up there for a long time — where you can click on any of these different links to get information about UFO sightings. Down here there's this U.S. law that forbids contact with aliens. How can you not click on that? I don't know if Newt Gingrich knows about this yet, but it's already been passed by Congress, which is why it's not in the Contract with America. Really importantly, here is that contact between U.S. citizens is illegal, but also their vehicles, it's strictly illegal. So, stay away from those illegally-parked flying saucers.

So this is the kind of world that we find and the attributes the Web has brought to the table. It can be summarized thusly: It allows us as viewers, if you want to call us this, to program and control our own individualized experiences. Sometimes we talk about the notion of mass individualism, where you can publish one document or video game. For example this, I would give everybody in this room a videogame, say *Sonic the Hedgehog*, and you'd play that and come back, but everybody would have a similar, but very individualized, experience. But if I gave everybody in the room a copy of *Apocalypse Now* and everybody went and watched that, you'd kind of have the same experience viewing that. When you're in control, you're creating your own individualized user experiences. That's a double-edged sword, and we'll talk about that.

Access and product information is getting quicker and easier, and therefore advertisers are more reliant on consumers to seek out advertising.

Now, the net affect of this can be either one that is very commoditizing — if all I want to do is get my product and my attributes out there and I've got a very high-premium brand, it would be very easy if that's all I do to commoditize my brand, sort of torpedo my own ship. Or, you can use these worlds and these zones to create loyalty; of course that's what we want to do. You've got to be very careful about how you go about it.

I think one of the keys are appeal. It's got to be very aesthetically appealing, it's got to be very easily navigated, very easily utilized by the viewer or the participant. It's also got to be extremely relevant, i.e. targeted. It's no big deal, I mean, all advertising has to have aesthetic appeal and has to be extremely relevant, but you can't ever forget that.

Most importantly, I think, is we've got to understand the unique attributes of open digital communication, and it's those that I want to talk about in terms of these zones. I'd love to get your feedback later on about this because this is not something we have. We're working on this on an on-going basis. What we begin to see at first is a point-to-point zone. It's sort of a service zone that a lot of people were talking about yesterday, which I think is maybe one step to what the Web is really all about — where you can do point-to-point transactions, you can chat or E-mail, or have customized point-to-point, sort of customer service, applications, or even digitally deliver your product, i.e. download a specific software browser something as a digital delivery of a product.

And that boils down to the Internet and the WorldWide Web as a communication medium, not as a publishing or broadcasting medium; that's really where the big... what is it... it's neither — it's somewhere in the middle that we haven't even defined yet.

For example, that can be some of the baseball news briefs that got keyed up here. Here's one, it kind of got corrupted a little bit, but people can go the *Netscape* news and they can talk about baseball. We went on and grabbed something about the World Series; people can go and talk about past baseball experiences, sort of point-to-point communications or a

form of communications. Here's the Sci-Fi channel. We did the UFO home page — I had to bring this in here — where you can write back and communicate on a one-to-one level with the Sci-Fi channel. We saw yesterday the Fed-Ex application, I believe everybody saw that, so I don't have to talk about that. You can go in and trace your package, real point-to-point communication.

The next thing I want to talk about is basically this programming as really a file server, or the Net as a broadcasting zone. Basically you create content and it becomes, from a marketer's perspective, a media play. I might want to associate my product with that content to point to it, or more likely I will go to that content and say, "You guys have such great content, I want to buy space on that content and I want you to link me or customers back to my site."

We think right now that this is a great way to use the Internet, as sort of a herding device, and I'm not sure that's all of it, to be quite honest. And an example of this is Time Warner's *Pathfinder*, or the CNN site, or what Dow Jones is doing — they're all sort of publishing applications.

Next I think is what companies will adapt for their own use, which I think is sort of standard info. These are the "Levitown Rowhouses" of the Internet right now, and there are thousands of them out there. There's EPIC, there's Talk to Us, there's product information, there's employment opportunities if you're a high-tech company, there's developer's corner, and to me it's sort of nameyourcompany.com. It's good, but that's only one zone, and it's very much "your company as publisher." And so the model done earlier is to link, to you create your standard zone, go out and buy space on the programming zone and break people into it. And that's sort of a model that a lot of companies are pursuing right now.

Novell is one of the better companies doing this right now. I'm not treating this site very fairly because I think it's a great site, but it is very much one of the standards, although better than most. One of the great things about it is that you can call out using form space navigation to [inaudible] product and [inaudible] the language and get the links to all the information in that language, which is a great... you should go in and check it out, it's really well-done. You can see here what's new. *CyberShow* is actually pretty good, with technical information, product sales, the employment opportunities and developers are on there somewhere on the right side, developers' services.

The last two zones are what we have to pay attention to because this is where the Web begins to become a new type of communications medium that doesn't exist anywhere else. Each one of these previous zones is really borrowed from another model — from broadcasting, almost a telephone communications type of a model.

The next zone is experiential, where there's an extremely high "wild" factor. You start to see new forms of communication, and you see the users in some sort of remote, voyeuristic control. We talked about the Internet before, the WorldWide Web as a transportation device. Well, we start to see it here as a transport for raw materials, maybe not Zima or people like in *Star Trek*, but things like — and we'll get to "the amazing fish cam" in a second because I think it is the most used example of that. Has anybody gone to — this site is beginning to get popular — the teller robotic garden? Anybody at all been there? Four people. Not enough. Everybody should go check out this site, it's very interesting.

You control a robot over the Internet that plants seeds, waters, and after that the plants grow. It's basically a robot in the middle of a bunch of dirt, and around that there are seeds and water and different implements that you can basically tend a garden with. The whole WorldWide Web community can go in there and basically see this garden, and so you're creating a very interesting experience, where you are going to that garden and actually doing things remotely. It's very interesting.

The “amazing fish cam.” I get to go in front of the guy with the fish tank. Intel’s got a great use of this sort of zone, where you can go out and sample their new microprocessor. So if you can get into this, it is tremendous. If anybody is in the room from Intel, we need more bandwidth here. You can go in and basically try it out and render an object in real-time utilizing their equipment. So you basically go in and create something utilizing their product. Then you get to look at it. This is a fantastic sampling device using that experiential zone, where I can experience the product as I can get to a place.

The last — and I think where a lot of work will be done very soon — is this collaborative zone, where we’re able to basically create shared tools that unite people in some sort of common experience in which we allow people to influence content based on those tools that are provided to them. We’ll see an example of how we’re using that with Zima. People will collaborate or potentially compute, do different things, using the Internet as a unifying network.

A good example of that outside of the Internet right now is AT&T’s Imagination Network, where I can give everybody a golf game, a tool, and I can play golf against Andrew. I might be playing in Boston, Andrew might be in New York, and we each have the same tool, and I can look at his shots, and he can look at mine and a scoreboard keeps track. Or just utilizing the Network as a way of linking our experiences and we’re collaborating in a game of golf — The Riddler is kind of like that. I don’t know if anybody is using the Riddler site, where basically you’ve got a whole bunch of people competing to find links in different sites or find icons in different sites. It’s not a great example of what I’m talking about but at 7:30 this morning, it’s the best. I’m just kidding.

What does this all really boil down to? I think the *Economist* said it best. There’s a survey — if anybody wants this, I’d be more than happy to send it to you — I think it’s the best writing that’s been done on the Internet anywhere in a general interest publication. On July 1 there was a survey on the Internet, and one of the quotes that I pulled out if it was, “The Internet was... people realize the Internet was just not a way to send e-mail, it could be a place to visit full of people and ideas. The growth of the Net is not fluke or fad, but it is the consequence of unleashing the power of individual creativity.” And that is really what the Web is all about, and that is damn frightening to us as marketers, where we’re not used to utilizing our customer’s creativity to rally around our brand. That, folks, is exactly what we’ve got to do and therefore our experiential collaborative zone I think is exactly the way for us to do that.

The only problem is that we started coming to all those realizations about eight months after the first Zima site was first done. What I’m going to show you is the way Zima has worked. Then at the end I’m going to tell you to forget everything you’ve seen because it’s going to be a lot different next year. I can’t give too much away, but I’ll take you through how the whole thing came to be and what’s there. Who here has read about it, who here has read about the Zima stuff? Who has actually gone there?

Wow, well, thank you very much. Anybody who wants a Zima, drinks are on me, after lunch. Here’s the site. What I’m going to try to do is toggle back and forth. This might get a little ugly, but I’ve got a... well, you’ll see. This is a Home Page, and we’ll come back to that in a second.

What is Zima all about? Well, it’s a clear malt beverage and it was born out of a lot of research that Coors Brewing company had done in the early 90s. Survey test after test on consumers showed they were demanding a lighter, more refreshing alternative beverage to beer or mixed drinks or wine coolers, and that’s really the need that Zima came out of, very much a user need. Regional testing occurred in ‘93 and ‘94 and national roll-out basically happened a year or so ago. Zima.com was a part of a national roll-out, and there’s both a voice response component and an Internet- based component.

The original site, which I'm not even going to show you, was there for about six weeks, and we said, "This is really horrible," and we came up with something else. But on September 15, it was the first consumer-packaged good to put a product, really, on the WorldWide Web. Coors Brewing was the first brewer on the Internet, the first consumer product to put an Internet address on the label. There's both an Internet address and an 800 number on the bottleneck of Zima. One of the things that we want to do is try to position the company in front of the consumer as a leader and an innovator as something — and we'll get into this — sort "on the emerge."

Our objectives were to reach primarily males between 20 and 34, to think about the matching facts to the Web audience here, associate Zima with things that were on the emerge, and whether there are emerging technologies, emerging sports — there's a lot of extreme sport sponsorship of Zima this past year — different emerging music and so forth, and things that were on the emerge. We wanted to link to things that were different, changing, fresh, and new. We wanted to be able to create a feedback loop with consumers, build a database and a foundation for a relationship-marketing program. We wanted to generate a lot of press attention, and I think we're pretty successful both in terms of trade, and much more importantly, in consumer press and broadcast. We wanted to tie what we could do on the Internet and what we could do on the telephone to actual purchase when possible.

Our creativity was really to try to build a world for the brand and its users, its customers. We wanted to capitalize on the badge value of emerging technology, especially — and really exclusively — the WorldWide Web. A lot of what we were able to do with Coors is built on trust and faith. We went in and we were able to convince them of the brand; and for the agency folks, we were very fortunate because a lot of it was done on faith. Nobody knew how quickly the Web was going to explode and grow. We said it's going to happen, and they believed in that, and that's exactly what happened. So we're very lucky and very fortunate there. But it's not enough.

We talk about people coming back to the site. You know, "How do I get people to come to the site?" What we've really strived to do is not herd people into the site so much, and in concert with that, really distribute the site to the rest of the world. That is another way of looking at it, and we'll get into that in a little bit.

We wanted to leverage the attributes of the WorldWide Web by capitalizing on some of those zones that we kind of knew existed but haven't really thought about too much a year ago. The tone we wanted was one that was very useful and very much in charge, in control. Very quickly, the mechanics were really to add value for customers in every stage of their brand adaption, adoption life cycle — from awareness all the way through loyalty and advocacy. If you look at the media side, the flip side of that distribution model is that we did want to herd people, and we came up, everybody got excited about the notion of herding, trapping and domesticating, and the way that we tried to do that was to publicize the site, both in terms of paid publicity or links and free attention.

Once we had people coming to the site, we wanted to engage them in relevant, compelling content. We wanted, above all, to initiate a dialogue and set the stage for action and, hopefully, the action would be purchase. That would be loyalty, and that would be mentoring or advocacy. As I said before, there are three areas we went into.

[One is] voice response — and I'm not going to show the AOL. Zima on AOL is very interesting. There are a lot of things we can do on AOL that we can't do on the Web right now, and if we've got time at the end, we might want to talk about that.

We'll focus here on zima.com. So here it is, again, and the first thing I want to show you or talk about is that one of the things we wanted to do to keep people coming back was to get them involved in something that happened in an episodic way or serial way. We came up, after

a little bit of searching, with something that really struck a chord with our constituency and those are the Duncan Chronicles, really just called "Duncan." Duncan is a 20-something guy who's got a good job in some sort of high-tech business, you're not quite sure what it is, and he has friends that you've been introduced to throughout the year. He's got a love interest, Alexandra, which has been an area that we've really focused on lately, the one that's really struck a chord with some of our users, or most of our users.

What we try to do is just provide this biweekly journal with Duncan around. We elicit or we provide occasions for purchasing Zima throughout this episodic adventure and we wanted to develop a very easy, quick, easy-to-read format for doing this, sort of iambic pentameter for the Web. If you think about it, nobody wants to read a screen; I mean, I hate to read a computer screen. Everybody in this room hates to read a computer screen. So what we needed to do is create a multimedia format, although highly restricted by the bandwidth of the Web.

Each story features an image at the top, an icon that you can download. We talked about distributing a site [so that you] can download that icon to launch applications on your desktop, a sound file and then a pointer. We don't believe in keeping people in this site, but pointing to other things that might be relevant to their lives and helping them control things better, [so we provided] a pointer to an external site on the Web. We made that a big part of it. We don't want to have people come in a site and keep them there and pummel them to death.

What I'm going to try to do here is just go off to it... Here is, this is an episode called "The Kiss," where Duncan first kisses Alexandra, so it's entitled "The Kiss," and we can read along here if you can.

I'm not going to attempt to read through this, but essentially they go back to her place. She's got a dog. [She says,] "Duncan, I had a wonderful time." Duncan, in a wonderful pool of clichés, immediately evaporates [inaudible]. They swing the door open, and if I download that sound, real audio is coming soon. I don't know if anybody can hear that. Could everybody hear that? There's a swinging door that opens, and you can download that sound and use that maybe when you shut your computer down or open your computer. She fumbles for the key, and here's a Zima-branded key that you might use as a button on your desktop. You can download it somewhere else. And then Snyder the dog comes. This dog has been driving Duncan crazy because every time he tries [to be] intimate with Alexandra, the damn Snyder gets in the way. But not tonight, and eventually Snyder falls asleep at the door. If I click on the door, it'll link me to another door, another site out onto the Net, but I can't recall exactly which one.

So those Duncan episodes continue on every week. Here's one that's up right now that's Halloween based.

(Let me go back to the top.)

They go to a costume party and they don't win the prize. I urge you all to go out and see it. Basically, the hook here is that people keep coming back for the Duncan episodes every two weeks, and it's working. The next area that I wanted to go into, if we can go back, is the "fridge."

The question that comes is, "OK, we create all of this stuff every week, now where do we keep the good stuff?"

Well, you keep the good stuff and the cool stuff in the refrigerator, so we came up with the fridge, and that is our repository for all of these great digital goodies and other content that we want to distribute out on the Web, [and it's] a spot where people can come to get them. We're going to go through the items on the right first. There's the fridge, and the items on the right were all downloadable multimedia files that are accessible through the fridge. There are views of a lot of product imagery, small sound files found in Duncan stories and other places,

icons that came out of Duncan stories and some other places, that are all sort of Zima brands, both through the Macintosh and Windows.

What we're trying to do here is provide a lot of value [inaudible] and diversions, but where the real hit is that we've manufactured little infomercials or video games that people can play that are brand-centered, and they can exchange notes about how they play or even collaborate on how they play using the Net as an experimental zone, a collaborative zone. We'll see a couple of examples of that. We'll go into the fridge. Creak — another sound file here — and of course, here it is.

It's an image map right now, and you open it up. We'll talk about the freezer, where only the really cool people get to go, in a second. Then there are leftover Duncan episodes. We'll go into views and icons and a few others. I got some bookmarks — a quicker way to go. The views that have been in the site we use to tell a little story in which product imagery is utilized, and basically people who are loyal Zima drinkers would definitely download these files. We've had people turn them into screen-savers. We talked a little bit before about unleashing creativity. When you go into this kind of mode, you are allowing people to take your brand access and do things with them. And that's going to happen anyway.

Here we've had people come back and utilize some of these images in screen savers and other things, which has been absolutely great. There's a little story here, but you can see all of the brand imagery that we use. So you can go back and just download all of this interesting stuff. This is really the popular one, sort of a Stonehenge Zima. You can't really see that up there, but these are refrigerators, and this is a Zima bottle with a full moon. So that was one that people liked a lot. Now a lot of this we did at the beginning, and I'm not sure we're going to pursue this too much in '96. [We asked,] "What are people going to use" And we took a lot of stuff and put it into the site, we thought very strategically. But by the time we were done this year, there was five and a half hours worth of stuff that you can do in the site, which is way, way too much in our opinion. We'll get back to that in a second.

So that's views. If we go into earwax, these are all the sounds that got loaded in... [playing sounds]... This came out of the date, [playing sounds]... oh, no, excuse me, that was when Snyder licked Duncan's head when he was on the couch and woke him up. We don't advocate those kinds of dates. This is another one from a baseball Duncan episode, where he went out to the company softball game and he was sort of Casey at the bat. [plays sound] Well, I got that one wrong, too. That was another Duncan episode.

Icons are all of the different icons that you can bring in either Mac or Windows format onto your desktop to utilize. You see, I don't know how well you can see them, [but it's] all Zima branded. There's a baseball, there's a Zima phone, there's a Zima perfume dispenser, there's an AOL logo, [from] when we did a press promotion with AOL. There are some other icons you can bring down to utilize. We found that, [with] the Net here, many of our users spend more time in front of their computer screens than they do in front of the television, and if we can brand the computer screen with some sort of a Zima brand element, so much the better. That's really what we're trying to achieve here from a marketing perspective.

The last area is diversion. There's one game that we worked with the developer to create, this little infomercial. We'll play caption contest in a second. My favorite game is a game... remember *Asteroids*? We developed a game like *Asteroids* that you can download in about a half an hour and basically you've got this little Zima bottle and it can shoot at all these bottle caps that come up through and break up into smaller bottle caps. It's like *Asteroids*, but every game element is Zima branded, and people download that and play it a lot. We've had very many—thousands and thousands—of downloads of that game. Let's go back to [the] presentation. So those are [examples of] how we try to distribute content out of the Web, and

we don't necessarily have to have people coming back to the site as long as we can take pieces of the site and get it out onto people's desktops.

The next area I want to talk a little bit about, and this happened so much faster than I thought it would, and people realize it's the essence of the Web and the most basic element of the Web, I guess: pointing and hyperlinking. If you are what you eat, well, on the Internet, you are what you point to. That is from an individual basis. I'm doing a lot of people's Home Pages out there just to collect people's link to their favorite things. As a brand, you kind of have to do the same thing. We basically [give] consumers an idea [of] other compelling sites on the Web, and that breaks down into two main areas: One is all the places that Duncan goes to or where the last Duncan episode links to, and the other is one that's gotten a lot of attention and has been named in a lot of reviews, "The best bar and restaurant guide on the Internet."

We just wanted to tell people where they could probably find a Zima, and so there is this Zima bar and restaurant guide that's kind of buried in the site right now, which is a bad thing, but essentially it's a directory of directories. I can take us there pretty quickly. So you can see you've got Duncan's favorites. Those are all the different places he went to: a college, Seattle, London, he went and bought something for Alexandria from the Internet shopping network, fun stuff like that. Here's the Zima Bar and Restaurant Guide — bar-hopping in Buckhead. You know [that] you can click there and go to Atlanta, and then everything else is organized by location. There are all these bar and restaurant guides in New York City; Long Island; Troy, New York. Any place there's a bar and restaurant guide, we link to.

The last item I want to talk about is some of the relationships—marketing campaigns that we've done. Internet marketing should not, cannot, can never be just a World-Wide Web site. There is a lot more to it than that, and what we've done is we've focused on two areas, which [comprise] the relationships. Everything I've shown you so far is to get people to come spend a little time. But how do you extend that relationship? And you've got to be very proactive about it. You just can't put banners out there and every time somebody comes across it they'll say, "Well, maybe I'll go to Zima today." We can reach out on an individualized basis to everybody who's ever come into the Zima site. There are a couple of ways to do that. You talk about the old 70s saying, "If you really love something, set it free," well, you know, and then you've got to use e-mail to stay in touch. And if you're talking about setting people free to link out to the rest of the Net, well, we really do encourage that. We don't say, "Come to the Zima site and we're going to keep you there for as long as we can."

If we can keep you there for forty-five seconds or two minutes, that's fantastic. We don't expect people to stay for hours, which people can do if they want to. It just so happens that the average session is about five minutes in Zima, but that's way beyond what we really ever thought we could achieve. What's more important to us is to be able to stay in touch through e-mail. If you come to the Zima site, and you have any type of question, there's a section at the top, write to us, we will send back an immediate acknowledgment of your message, and we'll thank you for your feedback. Every single e-mail that comes in is individually read by a Zima customer service person. If necessary, if it's just a compliment letter, we'll say thank you very much the first time around. It might need some follow-up—it really depends on a case-by-case basis. But if a second response is really necessary, a more personal correspondence is sent out.

Step one is to provide some instant gratification: acknowledge and thank the consumer for their interest. Outline what you're going to do for them and you'll see the expectations in terms of what your response is [going to be], and basically acknowledge the fact that they've initiated the relationship and try to create, even on your first e-mail back, a bond with them. As you can all read (I apologize for this), this is a general response that you get back from Zima when you go in. It says, "Thank you very much for mailing to You Can At Zima.Com," (which is

the label on the address, which was a thanks for that). There's also a file that will be attached that would contain those digital goodies.

The next step is to make your communications relevant, especially following up with any questions they might have. Here's a letter that came in from this guy, Thor, and it says... this is a great one, almost chosen at random, not quite, but seriously, this is what Thor had to say, seriously... this is a joke, right: "I've asked around and nobody, I mean nobody, has ever tried a Zima. Who the hell is Zima? What the hell kind of name is Zima anyway? Some kind of kinky, Aztec virgin wacko deal?" There's even a Michael Jackson joke... "I bet Michael Jackson is behind the whole thing. Go ahead, you can tell me, Zima is a hoax, right? Go ahead tell me, I won't squeal."

We wrote back, we say, "Hey, hey, hey, Thor." No, seriously all comments are welcome here, no matter how scathing. He says, "I don't think you'll ever write back to us." And we said, "You're intimately familiar with Zima to leave such an original, comical response. Honestly, I got a good chuckle out of your message." Then we answer any questions that you might really have had about Zima, and we say thanks for the e-mail. We attached a file, [and ended with] "I'm sure we'll hear back from you if I missed anything. By the way, I won't touch your Michael Jackson comment even with your keyboard."

And that is from the Tribe Master, and we'll get into what the tribes are about in a second. And all of a sudden Thor wrote back, "Yes, I sent it in as a joke, but I'm truly impressed that you sent a response. That kind of response is very refreshing coming from a big company. I'm having a big-ass Halloween party. The ice tubs will be stocked with Zima in honor of your wonderful response. You are invited." And of course we wrote back, "Thanks, if that party is within fifty miles of Denver, I'll be there. If not, fill me in on the gory details. Heck, I'll even bring some complimentary Zima." The Tribe Master.

So there you have it. It's very difficult to do that, but we've been able to do it, and we've really gone in and tried to build, and part of this program is to try to build, a loyal core of Zima drinkers. With Zima products, like most products, really the 80/20 rule is at play. For Zima, it's more exaggerated than that. The last step in creating bonding and advocacy is this loyalty club that we entitled, "Tribe Z." And that's where we really try to integrate the customer into the company. We try to give them a stake in the business, build a perception of value with an addition of added value for them. We came up with this strategy that focuses [on the fact that] only the really, really cool people get to go in the freezer. And in the freezer, we wanted people to be able to, basically... we'll get back to that.

We wanted to be able to get people to create their own space and experience their own space. The first thing when you click on that freezer button, and I'll go back to the Home Page, we love this, we're thinking about, what kind of initial interface should we have, and sometimes it's hard to tell what you can do on an interface. So we made what we think is the world's biggest button. Now what are you going to do with that? Of course you're going to click on it. And then you're in the freezer, and as it turns out the freezer is really a loft space, and you can see over here there's a refreshing sign that can go on and off. If you click on this picture window, it can reload the graph and it'll be a newly generated picture that happens in the frame here. Actually the copy spells it out a little better than I can. If you click on the light bulb, it's a deep-thought generator and it kind of comes up with funny sayings. Click on the picture. It's a random image generator. Click on the fire escape. It's a random jump station that sends you out onto different places on the Web. So boom, you're out of the freezer all over. Then click on the wall, and it still does nothing, and that's our favorite. And you can see, it's a very sort of smart-wise... we really don't try to be didactic to people within the site. We really try to... people will try to catch on to what we do... it's very Web-savvy.

We also like to decorate the Web. One of the first things that all the people who belong to Tribe Z got to do was to decorate that [inaudible] space. The first couple of weeks, we took a poll on what color people wanted the walls to be. There were three [choices] up there and you clicked on one. Before we did that, people got to select what the Tribe Z logo would be. There was one of five different selections they could have made. That one won by several hundred votes, and some tight polling. And then we needed to have a plant in [the] space. You could decide which plant you wanted to vote for to occupy space in the Tribe Z loft — a cactus, a spotted fern, the turtle fern, and as you can see here, the cactus was the winner.

So that's Tribe Z. Basically, what people can do within the clubhouse is participate in its design, and there's a form there for communications. We use that whole point-of-communications zone of the Web, a combination of that experience and collaboration, within the Tribe Z location. And then finally, we do on-going mailings to the Tribe Z membership base. There's the latest one that went out. "Grab a rake and get out in the yard, it's autumn. According to most sources, autumn begins about September 23 in the United States. In fact, the season known as autumn or fall can start on September 21 or 22 or 23. The numerous oscillations and wild motions that the earth undergoes both in its daily rotation on its axis and its annual elliptical course around the sun cause the day of the autumn equinox to vary slightly each year."

We go on into this whole kind of ridiculous tongue-in-cheek explanation of autumn. We talk about Zima at the end and we sign it off, "Now that you know that, go chop some wood." We usually give people an ability [to respond]. We either attach a file or request some sort of response, but on this one we didn't happen to do it. When we do allow people to respond, we get over 90% response to the Tribe Z mailings. We also give people the opportunity to get their name off the list and every time that goes out, it's far under one percent.

So, people, to be part of Tribe Z, do want to become part of the brand. They want to inhabit that space, that world that we've been able to create. But we always give them the opportunity to get out and we don't invade their privacy. A couple of things that we're doing in the fourth quarter of '95 is that we're going to include a couple of promotions and a drive to each program. We'll talk a little bit about that. First I wanted to show you folks, if I can get to it, this multimedia game that you can download called, Caption Contest. This is one of the games that you can download from the diversions section. The whole idea was to center people back into the brand and allow them to interact basically with the television commercials that were running at the time. If you can recall: those black and white television commercials with no voice-over, just music running underneath them, people...and when you see the images, you'll recall the spot.

So here it is, Caption Contest. [sounds] If you read that, you can see basically how it works. It says click on... these are the instructions that occur... and this is a scene taken from one of the commercials. So if I go into the intro, I can start to play by understanding it, by seeing what people are doing. "Did I step into what I thought I just stepped in? Guys, why are we following this dog? I could smoke these guys if I wanted with the gentleman on the bicycle, life after training wheels, not so bad after all. Bring in ultra-hip 20-somethings. He's not having to use both hands, he's carrying a bag of Zima over there." This is my favorite, as much as it is painfully obvious. This is known as product placement. "Hey buddy, listen closely, please don't drop me."

You can play around with that a little bit and get involved in the brand, just download this off the Zima site. But what this game is really focused on is allowing people to enter a contest where they would basically put the words in the mouths of the people in the television commercials and then we would allow everybody a look at everybody [else's] response themselves...and just download the instruction set that would upload the... download what

people... let me stop for a second. We wanted to use the Web here as that unifying Network I was talking about before, so we gave everybody the same tools. [sounds], I can select shots from three different television commercials. I can create [sounds and other] things, different funny scenes, whatever people might be saying or thinking, so I've got walking balloons and talking balloons here. Then I can click on save and I can save it as a file, and then I can e-mail it to the Tribe Master. There's a contest going on and has been going on for a while where we're selecting what we think are the funniest ones out there.

You can also download... the only thing that gets sent up is basically an edit decision list on where the file resides or where each thought balloon resides on the screen and what text is in it, so it takes about five or ten seconds to download these 'thought' balloons and then you basically inject them into your picture. And you can see what everybody else is doing, allowing people to communicate with each other in a new way. That's Caption Contest, and we can talk a little bit about that later as well.

The last area that we've got right now that's tied to media and getting people to revisit the site as a Web, we're calling a Web Master sweepstakes. We're allowing people to go into the site and register as Web Masters [in order] to get a link out of a banner farm that connects them to [our] site. Then we will randomly select people who link back from their page into the Zima site, and if we randomly select one of the links that comes from their page as a winner, the Web Master is therefore rewarded. It's not a sweepstakes for the audience. It's really a sweepstakes for the media providers. Instead of us having to go out and try to figure out where we want links to be, we can go out and allow people to link in and just approve them, which is starting to work pretty well.

There's the Caption Contest and Web Master sweepstakes. I want to talk real briefly about the media aspects, because that is one of the things that will get people to come back. The idea is to drive traffic to zima.com and AOL, drive the frequency of interactions, and really drive depth of interactions. One of the things that we found is that it really doesn't make sense to link people to your Home Page, but to link them deeper into the site. There are basically four ways to do it: Paid pointers, we spent a lot of media money this year, most of it very well, some of which didn't work out the way we thought it would, or wanted it to; reciprocal voluntary pointers, which is sort of what [the] Web Master contest is all about; Web directory, register your [inaudible] wherever you can; and traditional media channels and packaging, whether that's [on the] bottle, whether that's every print ad for Zima tagged with the Zima URL, for example. How do we evaluate our media and our program? First of all, is the content relevancy Zima demographic, sort of IOL, verifiable traffic that the sponsor site generated? We need to know from our media providers. We need to see hard numbers.

We also, and this is going to be especially true in '96, we try to take a unique view on how the [inaudible] and positioning can work, and we're working with several media companies right now to test new ways of thinking about how banners work. The overall point here is that properties have to deliver a demographic and psychographic profile that is consistent with our objectives. No big news there. Some of the placements that we've done this year, I'm not going to comment on any of them, but you can see them all up here. Most of them I think you folks are familiar with. These are just a selection of [inaudible] two or three times as much this year.

Other media tactics we talked about: directory listings, generally free. Publicize the URL: We've got hats, t-shirts, etc. out there with the URL on them. (I did sneak in a couple of slides.) I'm not going to talk about AOL, but we can do things on AOL that we can't do on the Web and we're learning a lot right now. AOL, by the way, is very expensive and it can be difficult to work with an on-line service because whatever you want to do, you can't necessarily do. In a lot of cases, they've got to approve it, they've got to run it, so it's not open and there's a lot of

bottlenecks there. But one of the things we can do better on AOL is chat, and we're going to have a lot of chat interactions going on this fall.

The other thing we do is we use the Web as a research vehicle. We have done an intense amount of research to see if our investments are paying off. One of the things we've done a lot of, as well, is a lot of qualitative research with people who are in [inaudible] to find out if we are hitting the mark, and that's very, very important. You just can't look at click streams and say, "Well people are clicking on this stuff, so it must work." You really have to go back to qualitative. Some of that can be done electronically, some of it is done in person.

How do we measure results? You measure it in both the depth and the frequency of interactions, not just hit rates, and I think we all know that the number of hits can be very misleading. We've done a lot of demographic, attitudinal, and volumetric follow-up studies. We talked about the focus group surveys, etc., very much trying to determine right now the lifetime value of Zima loyalty, of Zima users and what their loyalty is when we communicate with them on an on-going basis over Zima.com. We're constantly redefining and redeploying. Has everybody stayed awake? Terrific, I'm glad to hear it. Results: seven-figure, in depth sessions is basically what we've seen.

We've had a hell of a lot of people coming through the Zima site. We've had a hell of a lot of frequency and a very considerable amount of reach—probably about the reach that we expected with more frequency, if you want to look at it that way. That's not really the way we look at it, however, but I don't want to get into some unique measurement, the way we measure it in depth. One of the gratifying things is that every week we're seeing double from the get-go. There was actually a little bit of a slow-down over the summer, which is normal [inaudible] for on-line services. But this double-digit increase is every single week. You can imagine how that sort of compounds out. We talked about over 90[%] response rate to [inaudible] mailings, over 23 million press impressions, which has really paid for the program in and of itself. We really hit that one dead-on in terms of if you go back to what our initial objectives were, and we've been able to establish that emerg[ing] position with the consumer and with the trade. Especially with the trade and getting the product out on the floor, the Internet program worked extremely well.

What are we going to see in '96? We're going to have Zima 2.0. We'll be using Netscape 2.0 as well. We already have the foundation for '96 executions in place right now, and if nothing else, what we were able to do in '95 was to get to a level of understanding that, hey, this works, number one, and hey, we built the tools and the foundation to really build upon that. We think we've established a lead that we couldn't play catch-up on—it would be much, much more difficult to play catch-up. Our goal is to leverage those zones that we talked about up front much better than we have been able to do in '95 and invite and encourage interaction either through participation with content or via dialogue, which was up [in] front of all the rest of it. I basically went through those.

What we ultimately, I think, accomplished here was to deliver customized content according to [the] individual's and/or group's previous interactions with the brand, and current actions with the brand. We created a context to receive comments and to receive the customer into the brand and allowed different customers to relate to each other around the context of the brand. Every targeted message in '96 will be measurable for full budgetary accountability. We still will not get to this level in '96, much to my chagrin, but the good news is it's become a fixture in all of Zima's marketing plans. The brand will continue to invest in creating the best interactive-interface-content-relationship marketing programs for the Zima consumer. Thank you very much.

Andrew Jaffe: That was great, and I'm sure all of us have a lot of questions. I know I do. Let me just warm up while we get the lights on, and we'll get Matt down front so we can start scoping out which of you have questions. G.M., it seems to me you've become a publisher, and it goes to my point yesterday that I think some advertisers are ahead of the traditional media in learning how to use the Internet.

Are any other advertisers wanting to be on your site as a publisher? Have you thought of taking Tribe Z and developing a hard copy, some kind of publication in relation to it? Have you thought of events? Has MTV come to you and asked you if you can combine with them? If you can just address one or two of these points. On the downside, is there a problem in a beer company becoming a publisher in today's universe, where we're so worried about kids drinking and spirits getting too much of our culture?

G.M. O'Connell: Yes, well I think they're all very good questions. Let me address the last one first. You're faced with an alcohol beverage company and the one big issue is minors. There are basically a couple of issues. One is anybody who joins [inaudible] today, needs to be 21 years old, and we do our best to verify that. There are ways around that, like there are in any other venue. There are "Drink Responsibly" signs all over, if you guys wanted to see one: 21 means 21 and it's right on the banner, and we address those issues straight up-front.

One question was, do we have plans to sort of pligh it out to any other media, and there's been some discussion about the Duncan episodes going out to traditional. But everything is defined and designed to work on the Net, so trying to sort of do a reverse shovelware, if you will, doesn't really make a lot of sense to us.

Andrew Jaffe: We'll keep those in mind. Let's see if the audience here has some questions.

M: How many people do you have on staff answering the e-mail?

G.M. O'Connell: Originally, we had... I guess at Topo, that's going back... that was done internally at Modem. About six months ago we trained the folks at Coor's Brewing Company's customer service center to handle the mail. They kind of duplexed back and forth—they're very good at multi-tasking between the voice and written communications, so that if they're not on the phone, they're answering e-mail. There's no real dedication just to doing e-mail. Their CRL staff, I think, is in the tens. It's not over one hundred, but it's probably between fifteen and twenty.

M: I have two questions. What do you know about cigarette advertising on the Internet and how does a marketing director or brand manager ascribe sales to this particular medium... or sales results, to this particular medium?

G.M. O'Connell: In terms of cigarette advertising, I don't think the cigarette companies are going to touch this. I'm not in a position to make a comment on that; we don't have relationships with tobacco companies. In terms of how you get it back to sales, there's going to be a lot of promotional things, I can't go into any depth or detail [about what] we'll be doing in '96, [but] we know that [it] will be basically tied to product purchase specifically. As with any promotion, you can tie the card back. In terms of general image advertising, you do some volumetric studies, you do some qualitative and quantitative research on the back end, but it can be difficult, just like it is in traditional advertising. So, there isn't a great way of knowing right now when you're looking at landing on the Net.

M: GM, you had an interesting point up there. You said give them a stake in the business. Can you define that a little bit more, giving consumers a stake in the business on the Page?

G.M. O'Connell: What we want people to be able to do is [have] a stake in how the product is, and we take their comments seriously in terms of any questions they have about product attributes. There was a product extension called Zima Gold that went out this summer, and we got immediate feedback from Zima consumers [inaudible] on the Web as to how they liked that product. That product is no longer being sold, so it can work to your advantage or disadvantage. [What? It seemed like the feedback was advantageous] but it, [the feedback], really helped us very quickly.

The other stake is in market[ing]. If you look on the marketing side, if you look at what we did with Tribe Z — painting the walls, [inaudible] what we think the logo's going to be all about. The logo will show up in print in the mail and it was basically the users who decided what logo we would use. It wasn't a brand manager [inaudible] sitting in a cubicle somewhere.

M: Have you done any work on your response demographics, not just your target demographics, but who's actually working at this thing and [inaudible]. The other question is kind of related to that. I know you're doing a good job in making sure that there's a 21-and-over kind of target, but how many of your respondents are under 21 and is that a way [that] you're establishing the product for under 21 people in the realistic part of branding?

G.M. O'Connell: I'm not sure I really understood the second part of the question, but let me go after the first part first, the demographic question. We do a lot of traditional data base overlays given the responses that we get back vis-a-vis what any database marketer will do. We also do more lifestyle types of overlays and have done some work with Simmons and some other big research firms. For example, we can see that a much higher percentage of the Zima audience in general, and Zima users in general, utilize on-line communications in the World-Wide Web than the general population. Those people that come into our site, whose names we collect when we go back again are pretty much the typical World-Wide Web users that have come in sort of outside the educational arena, the post-grad arena.

M: I would imagine this is kind of like cigarettes, you're actually branding and your loyalty starts when you're a teenager, not when you're 21.

G.M. O'Connell: Absolutely not.

M: How many people are involved in maintaining the Web site and how much does it cost and does it pay for itself?

G.M. O'Connell: The answer is yes, going backwards, yes. Saying the exact number of people that are involved is very difficult to answer because there are people at the agency, there are people on the brand side, there are people where the site is actually hosted. But I would say that it was about six to eight people, if you rounded them all up. Sometimes that's higher when we're in a peak sort of creative mode, and sometimes it's lower when you're in more of a maintenance mode. How much does it cost? I can't comment on that.

M: Two things: Could you comment on the initial development time to get this thing out of the gate, and second, the developmental infrastructure. We do a lot of [inaudible] consulting and

Web sites [inaudible] working. Have you done staging servers where you're actually building this and giving the client permission to come in and take a look at it as it was being built?

G.M. O'Connell: The development tools that we've used in this way, and the time that it takes to do it, were much longer on the initial launch than they are now. There are so many better tools that are available. We didn't know what the heck we were doing when we first did this, nobody did. Nobody really knew what we were doing.

So originally it took about two and a half months to get the site live, and I think these days it can be done in less time. But it's not so much building the site, it's building the infrastructure for how you're going to respond to consumers, how you're going to allow them to participate and how you're going to build that over time. So the actual production model isn't that important for us, it's the thought that goes in front of that before you actually produce, and [that] takes a considerable amount of time. You've got to get a lot of people on the brand side and on the agency side involved and go through a lot of different iterations, and actually do testing of consumers beforehand. That takes the time.

In terms of staging servers, we didn't when we launched this thing. We do with other clients right now, so it really depends. If the question is if that's a good way to go, I would respond that is a good way to go.

W: My question is, "Has anybody done any research on how [Zima's] sales has increased since a site has been put up?"

G.M. O'Connell: Yes. The way we measure it is on a person-by-person level. The actual sales of Zima have not increased in 1995 because there's a huge initial spike of trial, and with any new product introduction you get a surge on trial and then the key is conversion. So if you look at, as the gentleman asked earlier, how you track that, specifically to the Web site, that is difficult. You can tie it back to some specific individuals, given promotions, but over time it's a little bit more difficult.

W: I was wondering, you said there was about five hours worth of information in that site, and I'm wondering, in your opinion, how much of this comes under specific product focus and how much is more off-shoot information and fun.

G.M. O'Connell: It depends. If you count the links, if you count where you can actually go with the links, then the model collapses, but I would say that 65% or 70% is product-focused.

W: How would you define a relationship where your Internet zoned two people now. If you're a publisher, define the relationship between publisher and other publishers on the Web: whether those publishers are other advertisers or publishers or other media-type vehicles who have now entered into Internet publishing.

G.M. O'Connell: What our relationships are? They're not with other advertisers, per se. I think there are two models that you see in the way "published" content is developed. One is derivative from existing publishing brands whether that [inaudible] or whether that is Pathfinder with Time, Inc. I think that's very dangerous. The tendency there is not to eat your young. You try to leverage off your existing brands and not kill your existing product, and that's very dangerous. Anybody who has developed a Web-centric product that does not have a parent to answer is basically, in my mind, trying to kill off... You're all competing for rep time or information-seeking time and your motto should be, "I want to slay the dragon." We don't care

who wins out, generally, and we work with bulk. We don't generally work right now with Zima, and I think that's unique because it is an alcohol-based product that a lot of other advertisers don't want to work with.

M: It seems as though you've managed to work a lot of branding into your site, all the way from a video game to the icons. Have you received any negative reactions from the Net community to all this branding, and where do you draw the line between branding your site and what the Net will accept?

G.M. O'Connell: I think there's a certain expectation that if you come to Zima.com you're going to get... and I don't mean that facetiously at all, I think that's one of the reasons you come to it. In that regard I think you get what you expect you might get. What we want to do is just to provide a great place for [people to] come and a context for them to communicate with each other around the brand. If we can achieve that, we've basically done our mission and we want to do it in a way that you can't do in print, that you can't do in TV, that you can't do using other platforms.

I think the ultimate compliment gets back to what I said before about the bar and restaurant guide: that's an information product that happens to be brought to you by Zima but you're going to go there simply because it's the best one that's out on the Net right now. Or you might play Caption Contest because it's a lot of fun, [even though] it happens to be based around the Zima product. It's a fun way to use the Net in a way that's really never been used before.

M: In the context of your comment about MIS people wanting to be creative directors, I'm interested in your thoughts about the role of the Zima Web Master.

G.M. O'Connell: What is the role and responsibility of the person who is maintaining the site, per se? [As for] the people who drive the content in the site, there's a creative director, there's an art director, there's a copywriter, and there's, essentially, a programmer. That programmer is probably one of the most creative people that we have, and we talk about MIS directors becoming creative directors. It's only dangerous if they're the ones doing the aesthetics, in my opinion. When they can work with the copywriter, I think the real creative genius, in our shop anyway, comes out. Copywriters working with programmers. How the hell can we use this thing that didn't really exist that much three years ago in a way that's never really been done before, and you've got to think about what's possible, what you can imagine, and then what's possible. And so it really requires a very creative pro... if you want to call it an MIS guy [inaudible] programmer, do that.

The Web Master is really responsive. It's an operation position within the context of what we do. It is not the most glamorous position. This varies around a whole bunch of different companies, but for us it is extremely important when it's your job to make sure that the site works. That's really what the Web Master's job is, that things are done the way they should be done.

M: You commented earlier on [the fact] that it took quite a bit of time early on because there was a lack of tools. Could you comment on what tools [you] use today, the type of tools that have helped you to increase productivity?

G.M. O'Connell: I'm probably the last person who could make a good comment on that in our shop. I'm not really involved in that. I'd be happy afterwards to tell you, to give you the name of

the person at Modem who is basically in charge of that. It's not only a question of tools, it's a question of becoming comfortable with designing for the medium, too. It's a little of both. But you see your productivity go up over time, as with anything else.

W: I have a question about the Caption Contest. Did your client put any restrictions on you as far as any controls to prevent any kind of poor taste or profanity, or is it just a free-for-all? And how are people behaving?

G.M. O'Connell: I won't say it is not censored. Everything that does go through gets seen by the brand. There are things you can get that you might not expect a brand to put out there, but we're not going to put anything out that would denigrate the brand in a big, big way. So it is censored, if you want to call it that. It's modified.

M: [inaudible] came to you with a new product and said, "OK, the target is women thirty-five plus," how would you respond?

G.M. O'Connell: I would want to know what they're trying to... you know... are we going to launch this product and can you help us. [inaudible interruption]. I would say right now probably it is not [inaudible], no.

M: You had mentioned that people go [to the restaurant guide] specifically for restaurant information. Do you use a spider to find new restaurant guide sites, or do you have someone on staff who surfs to find those?

G.M. O'Connell: I'm not sure exactly [what are] the tools that we use to do that. In fact, getting back to the gentleman who asked about the Web Master question, that is actually one of the things that the Web Master is in charge of, checking out new links, and that's one of the tools that we use. We're working on tools that do that and also on tools that really track where the competition's links are and everything else. There are so many tools that you can use to acquire information right now that are very, very powerful and a lot of the companies that are developing those right now are out on the floor.

M: The Internet [inaudible] itself really well for specific target marketing. Your product and the demographics that were existing on users matched very well. As the demographics broaden considerably, and you're dealing with services that have very broad appeal, talk briefly about some of the challenges in trying to be engaging in a more general sense without doing things that turn off other parts of your demographic's target audience.

G.M. O'Connell: I think, the big problem... nobody would say, "OK, who watches TV?" It's who watches what program. Who reads what magazines? As the market broadens, different demographics, targets, are going to go to different places. I think ultimately where this goes, and we talked about advertiser push and user pull, [is that] advertiser push is going to matter much, much more next year and even more in the following year.

When we're able to get our messages and involvement tools in front of the right people, regardless of where they are... The key is finding the right people and the right context and then matching those things, so you've got smart, addressable advertising. That really is what the Net is going to give birth to. Right now, because the Net isn't that intelligent, we can't really do that. But, ultimately, publishers are going to get extremely wealthy, more so than they are today, because media will become worth twice as much if you follow [inaudible] what John

Wannamaker said years and years ago, which is, "I know I waste half my advertising dollars, the problem is I don't know which half." Well, you're going to know, you're going to know which half you're wasting.

Basically you'll be in a position to find that out, and if you can make your buys twice as effective because you're buying people not property, essentially, media becomes worth twice as much.

M: The line of distribution: How did the distribution channels, that is the beer distributors, retailers, [inaudible] get behind that? Did they feel that that was worth dollars, being channeled into this new area, and if you have [inaudible] any point-of-purchase that you did that might have tied directly into Internet devotees that were able to pick up tearsheets or anything of that nature.

G.M. O'Connell: Yes, there are three things. First of all, it went over really, really big with distributors. Every year in [inaudible] there's a distributors' conference and I was amazed [that] you don't run into a distributor who is generally wearing a three-piece suit. I couldn't believe how connected a lot of them already were. I was amazed, and they were all over what we were doing, even more so than a lot of the senior management was at Coors, quite frankly. So, it was a huge hit with them—very, very surprising to me. I couldn't believe it.

There were three programs that we ran that got out onto the floor. One was an impact with AOL that was very successful. A buddy of mine [who] worked at AOL says that we're putting all the disk manufacturers out of business because they'll send you one every second day. We actually put some [out], and tested a program with the brand together...and it did not work very well. There are two keys to that, one is get the product out onto the floor and hope that it'll pull through. But just getting the product out on the floor—the shelf-space game—is a key thing.

The first time we went out, on the back of the Zima label, we printed the e-mail address, and there's some amount of spin on that. Then, ongoing, it's just on the label. But we didn't really promote that in a big way. The AOL promotion was the biggest one.

W: You commented that every targeted message is measurable for full budgetary accountability, could you elaborate on that?

G.M. O'Connell: I knew I shouldn't have put that one in there. Gosh, where should I start? It's both banners and we have a model, the [inaudible] point that refers to... We have a model called IRIS that stands for Internet Reach and Involvement Scale, and I don't want to get into its mathematics. But this is how we actually evaluate media buys on the Internet. It's based on a model that is print, and it comes out of the print world. It's a hybrid between a print-model evaluation, and a database marketing evaluation. So we're able to basically track on a per communications basis, per targeted message basis, what that really costs us.

M: Carrying on from that, is there a mix here, or would you at some point suggest that the media spin be completely on the Internet?

G.M. O'Connell: For the brand?

M: Yes. I mean, if you're getting more efficiencies, is there still a need for conventional media, or does it disappear at some point?

G.M. O'Connell: Well, we spend maybe 5% of the brand's budget, which is still a huge amount, on interactive. That's a rough guess, we're not even sure what it's going to be in 1996 at this point. So I would not suggest that it all goes into interactive. I think that you also have to remember, as I said before, a lot of what we did a year ago was a leap of faith.

On the part of the brand, we knew it, and if you're a marketer, you've got to reconcile two things: the inevitability that digital communications is going to happen and you've got to be there in some way, shape or form with the uncertainty of when that's really going to rock your world, when it's really going to matter to you in a big, big way. And it's that reconciliation that's key, and it's a timing issue. I think in that economist's article I mentioned earlier, they've got an interesting point, that is: this form of digital communication evolves out [of] and incorporates other media platforms like the telephone, like TV, that makes it much easier to control, but has addressability and functionality to it. So marketers very well might start spending money on digital communication that they don't even realize has been transferred into this middle arena. Video is still video, you know, a computer screen is still a computer screen, or a computer screen is a screen, a television screen is a screen, and getting people to relate to what happens to be on that screen is the job of advertisers, whether you're doing digital communications or one-way broadcast communications.

Andrew Jaffe: Let's take a few more questions.

M: Just one real quick one. You're hosting outside. Any plans to bring that inside, any reason to?

G.M. O'Connell: No. No, we do not want to be in the hosting business. AT&T is going into the hosting business, if they can plug a client.

M: I guess that you had some good and bad results from specific areas you've placed banners [in]. Can you be a little more specific on what worked well and what worked poorly in terms of wear, and how you might have changed your focus to make it more efficient?

G.M. O'Connell: I can't really get into specifics. I don't really want to talk about specifically what worked and what didn't. I think what would be interesting, what I would say is the most interesting case and is responsible for building the model for this whole banner, was when *Hot Wired* launched. Is anybody here that was involved in *Hot Wired* by any chance? Anybody advertise with *Hot Wired*?

You have investment with *Hot Wired*, right? [inaudible participant's response] It was [the] damndest thing. About a year ago it was the hottest media property I've ever seen in my life. It was completely over-subscribed. We had to fight to get two of our clients in there. We paid through the nose for it, we paid big. To get back to the question that was asked over there, from sort of a cost-per-interaction basis, it was too big, it was too much. I wouldn't pay that kind of money now, but at the time it made perfect sense, because if you were a brand that was on the emerge, and you weren't on *Hot Wired*, you were not where you needed to be. It was an ego buy, but it set the stage, because after that, [there were] no negotiations, they didn't have to negotiate. Ten or twelve weeks, thirty thousand bucks.

You know, that's it, you want in, maybe we find some space. And they sold it very well, and it was over-subscribed. As soon as that happened, our phone rang off the hook, and everybody [said], "Hey, we've got a property, ten weeks, thirty thousand dollars." It didn't matter what kind of traffic it had, that was sort of the standard that was set. I would say that through the next six months after that launch, we were trying to bring people back to the fact that a *Hot Wired* model was not the model, and it had to work a different way. But everybody

expected to get thirty thousand bucks for ten weeks. No matter what the traffic, you know, it didn't matter. That was almost the standard at that time.

People weren't really concerned about whether it was delivering anything, they were going after the ten weeks for that amount of money.

Andrew Jaffe: OK, last question here.

M: You were saying that with Zima 2.0, you're going to build to Netscape 2.0 standards, and I'm wondering how you do it in designing a Web site and all that. Do you take into account all the multiple browsers out there?

G.M. O'Connell: That is a really, really, really good question. I think the short answer is you can't. I have this slide that I presented at Comdex and it got a lot of cheers and a lot of boos. It was a comment on what Microsoft was. It lead off with, "I'm with Microsoft, and I'm here to help," [just] like the government. And I'm afraid that Netscape might be getting into that position, where pretty soon you're going to have Jim Clark showing up and saying, "I'm with Netscape and I'm here to help."

But Netscape is the standard, and I'm not sure what that standard means, or where it's going, or what part of the communications chain you need to occupy to become the next Microsoft. I think that's very unclear. But right now, they're kind of controlling that. They're not yet making money on it, but they've got their hands in every single piece, from server through development through browsing, and a lot of different measurement places in between. We're where the users are and, by far, most of them, especially for a brand like Zima, are using Netscape.

Andrew Jaffe: Great, thank you very much. [applause] G.M. will hang on here for a minute or two if someone has any individual questions, we're going to reassemble at 1:00 PM for "Virtual Reality."

THE POTENTIAL OF VIRTUAL REALITY FOR CHANGING THE RETAIL LANDSCAPE: WILL AGENCIES OR SPECIALISTS DESIGN THE NEW FRONTIER?



MODERATOR

Andrew Jaffe

Vice President/Executive Editor, *Adweek Magazines*

SPEAKER

Rob Gemmell

Creative Director, CKS Group

Andrew Jaffe: This next presentation is to take us, really, into the future. All of this is, as the last speaker mentioned, is really so new. Somebody at the break came up to me and asked me, “Is there a media company that has specialized in digital only?” And I’m not sure I know of one. I know of ad agencies that say they only do digital. But I know of ad agencies that have interactive groups, and within that group, a media-buying unit — big agencies. But I don’t know of anybody out there as an independent who’s claiming this expertise in exclusivity, in a total focus. So it’s a reminder of how new all this is.

And yet a year from now a lot of the things we’re presenting today “oh yeah, I know about that, I know about counting people, we do that; I know hits don’t matter, we do that.” And when you design these programs, you try to think of these things. Well, where is this all taking us?

One of the tools that is going to become even more important as we get bandwidth is going to be virtual reality. I believe Metromedia has some magazines in this area. I know a lot of people in this room are familiar with it and have seen it demonstrated. But how many of us are actually designing virtual reality products for our clients? And how many of us are using virtual reality programs in our agencies to help clients see things that they need to see?

I feel that CKS Partners is one of the leaders here, and perhaps it’s because of our closeness to Apple. Most of the partners came out of the Apple culture. Apple is working very hard on *QuickTime VR*, and one of the reasons I got an idea for this was by attending the Apple’s New Media Forum in New York, where they started showing some of the advances that are going to happen in the next two years in VR.

So I turned to Mark Kvamme, and Mark couldn’t be here today, so I asked Rob Gemmell to come. Rob is, as you will soon learn, totally qualified in this area, and in fact may have a more detailed understanding of the tools and the technology than Mark did. Rob is the creative director for all of CKS. CKS is — in the San Jose office, he cautions, in case there’s anybody from the New York office — CKS is now, if you capitalize their income, a three hundred million dollar agency with 200 employees, with offices in Portland, San Francisco, Silicon Valley, the San Jose office, New York and London.

It was started in 1987; it’s now really four companies — there is CKS Partners, which does consulting and advertising; there is CKS Interactive, which I believe has a relationship with [Interpublic], and it does interface design, marketing research, works on the Internet, and does title development. In addition, there is CKS Pictures which is a production facility that CKS bought from Apple — it’s essentially Apple’s production facility; and there’s CKS Media.

CKS calls itself an integrated marketing communications firm and not an advertising agency. And I think CKS Communications is another company that really is trying to move away from the advertising agency designation. I’m not sure that this is as important as the Partners feel it is, though we could debate that at some other time.

Getting back to Rob. As creative director he's involved with advertising, branding, corporate identity, packaging, and interactive and on-line media. CKS and Rob himself were involved with some of the first experiments in virtual reality environments, working for National Semiconductors and Compton's New Media. Before that, early in the '80s, Rob was at Apple doing product development and as a creative director; and later in the '80s he had his own catalog and retail firm before the partners persuaded him to come back into CKS.

I think we're very lucky to have somebody like Rob here to tell us about this new frontier, if you will, or new platform or new technology, and the uses of it in marketing. We could have gotten somebody from Apple to talk about the tools, but I think somebody applying them is always more fun, and somebody who knows our business. So with that introduction, I'd like to introduce Rob Gemmell.

Rob Gemmell: Thank you Andrew. I apologize that Mark couldn't be here today, but hopefully from me you'll get a little more of the creative stand on how we operate. Also, I'll give you a taste of some of the realities that I and the teams encounter when we're actually trying to deliver on some of the promises we've made. I think one of the best things about being in this business is that you can dazzle people with an awful lot of slick presentations and neat tricks. But then when it comes time to deliver, sometimes you learn how well you can dance.

So what I'm going to do here is I'm actually going to switch between two computers because, as I discovered when I got here, there are some limitations even with the computer technology that's rentable here in Boston. So I'm going to be giving you a text presentation in *PowerPoint*, and then we're going to be looking at some interactive presentations that are in *Macromedia Director*; and then we'll be looking at some *QuickTime VR* samples, too.

Thank you, Andrew, for that nice presentation.

Today what I really want to cover with all of you is some background — how I ended up here. Andrew covered an awful lot of it, but one thing that I hadn't mentioned to him was that I started as an artist. I studied painting, sculpture, that type of thing. Ultimately I started developing what I called non-functional furniture, which ultimately led me into the architecture program at the university I was going to.

About a year after that I was hired by George Lucas to work at his fledgling Industrial Light and Magic facility north of San Francisco, where I learned one of the most important lessons that I continue to remember today, and remind our clients of from time to time — and that is that the world's best special effects, gimmicks, gadgets, and tricks don't mean anything if people aren't interested in the story that you're trying to tell. And that was something that George firmly believed in, and he attributed that to his success. The special effects in his movies were largely in the background of the human drama that was unfolding. So I've employed that and many other lessons learned on the journey and what we're doing today at CKS.

We have what we call an integrated marketing perspective, which means that when our clients come to us and they say they want an ad, they don't always get an ad from us. Conversely, if they're looking for a packaging program we don't always recommend that either. So it works both ways. But we've grown an awful lot in the last few years, very rapidly, and we've gotten an awful lot of notoriety for some of the business practices we have — not that they're unethical — just that we're very creative.

But I would say that our growth has been based on our ability to respond to what our clients have been asking for. Sometimes we haven't responded with specifically what they've been asking for, but we've responded with something we felt would deliver what they were looking for. And along the way, we've done everything we can to exploit the technology that's available to us and that we've been exposed to. So we're always pushing the envelope in that sense.

Lastly, of course, we're always trying to provoke people — not just with the technology — but with the creative work we're developing, as well as the medium that we select to get that message across.

One of the fundamental things we believe, and it's probably because we're in the center of a valley full of engineers who are great skeptics, is that we assume all of our clients and the audience members are from Missouri, the Show-Me state. They just aren't going to buy something unless they've seen it demonstrated in as realistic fashion as possible. This has led us to the development of what I call "PSDPS." PSDPS is my acronym for "powerful simulations demonstrate, persuade, and solve," products, services, concepts, ideas, whatever it might be. So that's a very important component of how we operate.

And then lastly, something else we've learned is that if the movie is good people will wait in line. But as we've discovered, as we've sat waiting and waiting and waiting for something interesting to download, whatever we're downloading had better be very good or we're not going to be back. And in spite of the leverage that Woody Allen has gotten out of interviewing people in theater lines at his movies, our customers and our clients don't have the patience that he might have had.

What I'd like to do now is actually go through just a quick peek at how we ended up where we are.

The first things I'm going to show you are in fact 2-D simulations, but I'm going to show a few of them to you because they might inspire some of the things you're doing. They also might show you some ideas that can be leveraged in the Internet environment. So if my helper here will switch me to button two, I'll go into a couple case studies.

The first one here was United Airlines. A couple years ago we redeveloped and redesigned their identity program. I'm not going to go through that whole thing, but I want to show you the — I'm going to show you a quick peek at a program we developed in-house. I'm going to skip ahead here real quick.

One of the things that we learned how to do very quickly in the Macintosh was to simulate presentations. These two images right here are simulations of what the new plane would have looked like with the colors that we were recommending. It was effective enough that it got Steven Walsh, who is about 6'5", to stand up straight out of his chair during the presentation and accuse one of his VPs of authorizing budget to repaint one of their planes. So that was a little intimidating.

Another thing we did in the process was we simulated — and this is kind of as a freebie, which we later regretted — we simulated how this identity program might be extended throughout some of their terminal designs. (And that was a real plane, by the way.) And the simulation that we presented was of the San Francisco Airport terminal. Now, we did this photographically and presented it to them, and we didn't charge anything for it. We kind of tossed it in there as a freebie. But they liked it so much that they went ahead and hired an interior design firm to execute this nationally. And it was only after the presentation that we had learned that the last time they had gone through this drill they had spent several hundred thousand dollars in the creative development, another sixty thousand for the building and construction of the mock-up and so on — and we gave it away. Anyway, that's one of the drawbacks.

Another case study that I wanted to show you for a much smaller company, one of our Silicon Valley start-ups named Co-Active. They wanted to get into the networking business, but to keep it very friendly. One of the things they were very concerned about was the use of their packaging and how it would perform in a retail environment. So we simulated how different packages would look in their portfolio — I'm sorry, on the shelf — as well as simulated how it would look in the retail environment. This is a pure simulation here, which we were able to

execute a lot faster than building the mock-ups and going through different iterations. So here's a simulation of how it looked in a retail environment. Now, we crowded around all of their competitive products at that time, so you can see the amount of consumer punch and impact that this packaging had versus what the competition was doing.

And then just one more sample, for Norwegian Cruise Lines. They were exploring the notion of developing a new identity, and it helped them update their image. We worked a little bit with [inaudible] on this, in developing an identity that would also work effectively on broadcast and other mediums. These are samples of their old materials, and some materials that they produce onboard ships.

But I think one of the most interesting things we were able to do here was take images that we had fabricated as virtual blanks, and then paste onto them electronically how they might appear as executed. So that's what we're looking at right here. This is an image taken from an ad and pasted onto a luggage tag, a simulation of the identity pasted at the bottom of a swimming pool, on a beach towel.

[Here's] another version, the application on dinnerware plates, and other variations, as well as toiletries and other bathroom accessories.

So that's where we had been operating, in a purely two-dimensional world. But we had done another thing, too. Some of our clients were working on products which were basically high-tech, and they didn't have the functional versions of the products to demonstrate, whether it was to potential customers, to investors or alliance partners. One of these was Nextell Communications. Nextell had raised an awful lot of money on the market, and they were looking for other people to invest. We helped them put together a presentation which they presented to MCI and to Wall Street that allowed them to raise over a billion dollars in capital.

I'm going to give you a quick peek at this. This was the opening intro for this presentation that was given. I'm going to jump ahead here a little bit if I can. This version was also developed to be used in trade show and kiosk environments, so we've got some questions where we were able to gather some data on the viewers. I'm just going to click these real quick so I can move ahead.

And then we got into a mode where there was a menu, and you could learn an awful lot about the services and capabilities of it. But what was most compelling was the demonstration of how the product worked. Here we go through a quick demonstration, and we walk people through the various steps in operating one of these phones. It demonstrates the text and voice communications capabilities. So I'll click on this key here. This is important because I'll show you something later on where we've integrated some of these lessons with *QuickTime VR*.

And then we scroll ahead here until we get the pizza to go. Then we go through the process of ordering a pizza. Now, it was about a year after this presentation was completed before they had a functional phone, so this presentation got an awful lot of use during that year. At the time, they didn't have a Web site — it would have been handy to have put this up on the Web site.

So that's an indication of some of our thinking and how we address some of the problems that our clients have presented us with. And I just went through a few case studies there, which you saw.

One of the things we discovered, as you've discovered in [inaudible] launderings, is that there are a lot of lessons that we need to keep learning — and it's not that we're slow learners, it's just that the technology and its capabilities keep evolving, and every time it evolves, you get an upgrade in hardware or software, you need to learn the new rules. I think it's going to be an awful long time before we have hardware and software parity. One always seems to be ahead of the other — it's something we have to wrestle with on a daily basis, and one never seems to be fast enough for the other, which has led us to really and truly enjoy the joys of acceleration.

We're always investing an awful lot of money in chips, cards, and anything else that will help us accelerate what we're doing. But as we all know, acceleration is fleeting and it's not long before we're dissatisfied again.

One of the other things that we wrestle with continually is the multi-meg versus multi-gig issue on storage and RAM. There never seems to be enough space. We're looking forward to a multi-gig, as soon as prices drop to the level where everybody in our studio can be employing multi-gig drives to store images. It's been one of the most limiting factors; in fact, the computer that we have today that we're presenting on only had a 500 megabyte drive, and so I'm splitting this presentation between several drives.

And then, of course, for virtual reality and environmental simulation, the issue is rendering. Rendering is incredibly slow. This one program we used recently, when we set up a virtual environment, we set up to render, and the dialogue box came back with the ominous message in estimating the rendering time: about two months.

The next issue, of course, is that as the capabilities have increased and become more complex, the old adage that rocket science is not required has unfortunately changed. We've got some pretty bright people around who still get stumped on a regular basis. And ultimately, of course, this begs the question which was part of the title of this talk: agencies or specialty firms? Well, I'll get to that a little later.

And then lastly, having to do with reality — everybody has seen *Jurassic Park* and this holiday season, I imagine, almost all of you will see [inaudible] and the new movie, *Toy Story*, which has incredible rendering and virtual environments in it. Unfortunately, the machines that do movies and that the special effects were created on are incredibly expensive and not generally economic enough to use for an awful lot of our clients' needs. So we're always wrestling with the difference between what they want, what they've seen, and what's deliverable within their budget or the time frame that they've allowed for a given project.

Virtual worlds await, but many are here right now. We were developing these simulations which I showed you: United Airlines, Norwegian Cruise Lines, that type of thing. But we were looking for other ways of presenting what we could do, particularly when it came to packaging and merchandising programs. We really wanted to simulate the retail environment. But we really hadn't found an inexpensive and easily executable method until we saw the program *Myst*. How many people in here have seen *Myst*? *Myst* was the first example that we saw where a fairly inexpensive software program was used to create a really interesting virtual environment.

We took the lessons from that and did some experiments, and we concluded that we could do this in a fairly economic fashion for some of our clients. But it wouldn't be cheap at the same time, so I spent another six to nine months trying to convince clients to sponsor an experiment to see if we could help them.

Finally one emerged — National Semiconductor. National Semiconductor is not known to probably at least a few of you, maybe a lot of you, because they mostly make chips and that type of thing. But they decided they wanted to get into the consumer marketing end of their business and sell networking cards. But they didn't know anything about that business, so they came to us to poke around for ideas, and to create what in essence was a virtual campaign, and show how it might be executed so that they could finally make their decision — whether they wanted to pursue this path or not. So we took *Stratavision*, which was the program used to execute *Myst*, and developed a virtual environment. And I'm going to give you a sneak peek at this. We haven't shown this to many other people because this is just the first test. Unfortunately, the funding was ultimately cut as they discovered that the retail channel was already loaded.

But I'm going to show you our first pass at trying to demonstrate to them how this virtual store would work. The first image you'll see was one that was rendered using a [inaudible] method, so that we have very accurate reflection shadows, that type of thing. Now again, this is the first test, and I'm showing this in 8-bit mode, so you're seeing an awful lot of irregularities in the color. And then we set this up so that as you navigate into the store, you move almost like you would in *Myst*, in steps. But somebody could decide that they wanted to go down any of these different aisles, or they could view packages that were displayed here on end caps. Then this aisle here — we've got an awful lot of networking products. So we simply move forward as if you were shopping in the retail environment.

And then you could take a look to the left, as if one of the packages had grabbed your attention. And as you might have experienced when something has grabbed your attention, whether you're shopping for *Cheerios* or a software product, you usually scan the aisle first and then you approach — you want a closer look, so you zoom in a little closer. And then usually the last thing you do before you purchase the product, if it's one you haven't bought before and you're not really familiar with, is you want to take it off the shelf and examine it in greater detail. Now in this test — we didn't have the full execution here — but this is sort of a demonstration of how it was going to operate in the fully rendered version. Now you can see part of one of the side panels here: as you click on the side panels, the package rotates so that you can actually zero in and read the specs and information about the package and the product itself.

So this is our first experiment with a real virtual reality environment without using any of those programs. One thing I wanted to mention to you was that one of our programmers actually set this up in such a way that every single package you saw in the store could be selected and lifted off the shelf. So this became a rather large file, to say the least. But we did take it on the road with us to do some focus group testing, and we did some traditional focus group testing with packaging. And then we went to this presentation, and it was amazing to see people's eyes light up when they were able to put themselves into shopper mode and actually navigate through the store themselves. That was our first experiment.

I don't know how you felt about what you saw, but we were, quite frankly, a little disappointed that we weren't able to get a higher level of reality. And reality is the name of the game when you're trying to do this type of thing. So we went looking for another client to sponsor the next rev. It took us a while, but eventually we found one; and the client was Compton's New Media. Now, Compton's competes against Microsoft, and they had been getting their butts kicked by Microsoft — of course, almost everybody does — and they had gone through a management change. They had a new management team who wanted to come in and basically demonstrate that they could provide a lot better competitive challenge than they had in the past.

So they wanted to put together what they called a "virtual merchandising" campaign to show customers that they had the juice to basically re-introduce a product line and merchandise it appropriately. So we did some more testing.

And I'm going to do two things here: I'm going to show you some of the testing, and then I'm going to explain to you what we learned in the testing; and then show you how we finally solved the problem.

We tried to do another virtual tour and this time, rather than using the program that we had done before and creating a *Director* show, we wanted to use an upgraded version of a three-dimensional modeling program and do a fly-through of the environment.

The first experiment we performed was just to do the fly-through of the modeled environment, which was rendered in a very primitive fashion, before we actually placed the imagery in there, the graphic images. So the image is very small here so that we can get some

speed. But we're actually flying through the environment and going down a retail shelf, we're encountering some of the point-of-purchase display, samples and that type of thing; and then we're ending up in the cash register area. Now this is to be an opening loop that would do a quick pass of all the different merchandising materials that were going to support the new product line.

So that worked okay, but when it came time to actually apply the real graphics it took 38 hours for each frame to render. So we quickly decided that wasn't going to work, that the software wasn't quite there yet. And we went with another course which I'll show you now.

The testing paid off in that we didn't invest an awful lot of time, but we did find out that we had to come up with another solution. The other solution, again, employed some Macromedia *Director*, but we were able to present the environment that people would encounter in a much more realistic fashion and render it using [inaudible] images so that we have actual reflections, cast shadows, that type of thing.

Then we put this together in an opening loop which would go through the different scenes that somebody would encounter. So you can see some of the countertop display, self-shipper, point-of-purchase display and other materials. Here's an end cap, end poster, and then I think we've got a view of the front of the store, too. Here we go. We've got some hanging posters and danglers.

Now, this is an opening loop that was used for this demonstration, and it did prove to be very effective in convincing the retailers that Compton's was, indeed, committed to supporting their needs.

So we are still learning and experimenting at this stage with this process. We were still looking at lots of different software programs that we could run on a Macintosh platform, and therefore be inexpensive to use. But we hadn't found what we considered to be a long-term solution until Apple invited us over to give us a sneak peek at a beta version of what they were calling *QuickTime VR*. And the first versions we saw were very buggy, but we could see that the software program had an awful lot of potential. At the time they dubbed the *QuickTime VR* as "a spatial interactive environment for developing and viewing panoramic or object movies."

"Panoramic," as you probably know, is moving around in a 360 degree fashion, and being able to view an environment or room, that type of thing. "Object" is where the focus of attention remains static, and you move around the object. These environments were created by electronically stitching photos together. In a panorama, they would be basically done in a 360 degree circle that would place you, the viewer, in the center. In an object-oriented mode, of course, you would create this sphere of images 360 degrees around an object, around which you navigate.

But then they also introduced animation, which could be paced to [inaudible] employed, as well as what they were calling "hot spots," which would allow you, when you clicked on an object or a certain area, to launch still images, *QuickTime* movies, audio tracks, text, or other things that you wanted to launch when you clicked on that object.

I've got up here, for those of you taking notes, Apple's Internet address so that you can call and get more information. As a matter of fact, if you do contact them, they will send to you a CD-ROM disk that has all the software demonstrations that they've produced, as well as a copy of this white paper that you can print out that explains in greater detail how the software operates. At the end, I've got another slide that goes through that again if you don't have time to copy it down now.

So we were doing some experimenting with this and we thought this was pretty interesting, and we decided to do an experiment. But before I show you our experiment, let me give you a sample of how this software operates.

This first view that I'm going to show you is the Salk Institute in La Jolla, California. They placed the camera on a tripod, and basically did a panoramic view of this space. Now the way it operates is, you take this cursor, you hold it down, and then you can rotate in the space: you can pan up, you can move down within the image area, move around in the space, and if you want to you can actually zoom in or zoom out in this environment.

But this program is not limited to just pasting together photographs of environments or images — you can also create imaginary environments and do the same thing.

So this is a virtual environment. This place that you're going to look at right now doesn't exist anywhere in the universe; but we've created this environment where it certainly looks very real. You're able to navigate around in here and pan around 360 degrees, up and down; and we've got an awful lot of reality, even operating here in 8-bit mode. We can still see that in a high resolution mode, it would be very convincingly real.

And then lastly I'll give you a demonstration of how the object-oriented operates. Now this is a normal credit card, this is actually one of our guy's credit cards, and if you look closely you could actually copy down his number if you want to. So I thought that was awfully brave of him. This is a Citibank card here, and on the back, you've got his real signature, his account number — so I won't dwell too long on there in the static mode. Anyway, so you can rotate this around in any direction you want. Now it operates a lot faster, and it requires a lot less storage space if you do it against the black background, but we found some tricks that allow you to do it against the rendered background, too.

So as we were exploring this, we were asked to put together a presentation for Time-Warner Interactive, who wanted to [inaudible] for the largest-selling coin-op game they'd ever produced into the home. As a matter of fact, they wanted it over to eleven different platforms, to introduce them simultaneously; this was the first time this had been done. Not even Nintendo had done this. But they were up against Nintendo, Sega, and people with bigger budgets than they had; in fact, I believe Nintendo spent about forty million dollars on their campaign to introduce *Donkey Kong*. So Time-Warner, with a few million dollars, was trying to make it look like it was in the ten to twenty million dollar range.

So we worked with them to put together a virtual launch that would convince resellers to place a lot of advance orders, and basically lock them in. But we also wanted them to buy into the vision of Time Warner and the character of the product. So we did the whole thing in character. So, as they've described it, what they wanted to do was butt-slam the retailers into buying their product and making advance commitments during the spring quarter for the following holiday season. This was March when we were contacted, so we had to put this thing together very quickly. We didn't have much time, but we did find an opportunity here for our first use of *QuickTime VR*.

So hang on here, I need to close a couple things down before I launch this.

The product was called *Primal Rage*. For those of you who keep seeing *Doom* and some of the other "kill 'em" programs, it's very similar to that, but it doesn't use humans — it uses animals and monsters, that type of thing. But it's still a very violent game, and it's very popular primarily with adolescents — but I should say adolescents of all ages. So during the development we had to install, of course, one of these coin-op games in our cafeteria, which was used almost around the clock.

Now we put together this presentation that they could take out on the road and use at conferences in presentation suites to demonstrate what this could do and also to convince people, potential buyers, that Time Warner was fully committed to supporting it. Part of this required some level of customization, so we built in here a routine that would allow you to go through the list and select whomever you wanted to present this to, and paste their logo in

here. In this case, I'm selecting Sears. So you see the Sears logo appear there; just a nice personal touch.

And then as you go into it you've got this nice, pleasant background music that lulls you into the presentation. And the presenter can extemporaneously talk about whatever they want to until they feel that they've got their audience properly prepared for something a little different. And then when they clicked, they hear some jungle sounds, a roar, and then we enter the program in character.

Now because this is going to be introduced on eleven platforms simultaneously, it gave people a sneak peek at the different platforms and how the game looked on those various platforms.

Then we went through a lot of routines where we presented simulations of print advertising. Then we actually produced their broadcast spots. I'm not going to show all that to you today, but we did create some packaging, that type of thing, and I do want to show you that.

Now one of the fun things we did was we created this interface with sound effects. If they were in a playful mood, they could actually perform a drum solo here for their audience.

So let's take a look here at some of the consumer support material that we produce. We were in character the whole time through this presentation.

And then we gave people a demonstration of the different media which is supporting the introduction of the program. So this is just a quick rendition of a typical retail environment. The one thing that worked very well with the retailers and the resellers was the integration of *QuickTime VR* to show them the packaging all the way around and allow them to zoom in and look at the actual copy and some of the illustrations in greater detail. So these are the first views here, and I think this was, with one exception, the first commercial use of *QuickTime VR*.

So that worked very effectively. Within a few weeks, Time Warner was able to exceed their sales goals and commitment goals with that roll-out campaign.

At the time, Apple was having a tough time demonstrating and convincing people of all the different qualities that *QuickTime VR* had within it. So they put together a project to demonstrate this and serve as a case study. This project is actually laid out in this White Paper that you can get. And they produced a video that demonstrated how they actually executed the photography. I've got a version of this the I can show you at the end, but I have to reformat the monitor to do that.

I'll show you another simulation that is very similar to this that we did. But what they did was integrate *QuickTime* videos with the *QuickTime* virtual reality, and they created a walking tour of the Apple Company's store, selling computers and apparel, that type of thing, all supporting the Apple brand. But they demonstrated here very convincingly your ability to browse, compare, shop, get detailed information on products as well as specifications. And if you wanted to you could potentially order them, although they didn't set it up that way.

But what was interesting about this was that they were able to execute it for something considerably less than the huge budgets that were required for some of the other solutions that we had seen. In fact, they will tell you in the document that the resources required were eight weeks to execute this, nine people were involved in the team, and they spent \$31,000. You can see what I've got up there in parentheses though — they weren't looking to make any profit on this.

So we took a look at what they had done and felt that we could do something similar, but we knew that we just had to basically do it ourselves. We weren't going to find somebody to sponsor this effort. So we actually did our own version, which I'm going to give you a tour of right now. And what we wanted to show people was the environment that our interactive folks operated within, as well as give them a notion of what *QuickTime VR* could do. And we wanted

to demonstrate that we understood how it operated, and we that understood enough about it to execute it in an environmental fashion.

So we created this walking tour environment down here, which is actually a map of our interactive group. They've since grown so much that they've moved into their own building across the street. But here we start with this view right here. Now each of these dots symbolizes a node, and you can navigate from one node to another. So I can stand here in this node, and rotate 360 degrees. I can look at the ceiling, I can look at the floor, I can do all of that. I can't look at my toes, because we cleverly hid the camera.

And then if we want to we can actually navigate down the hallway here, move to another node, another one; again, we can navigate and panographically view what we've got going on in this area. We can move back here. We can zoom in, and I think I've got *Mr. Potato Head* here. And we added this little interface that allows you to zoom in more easily, rather than using command keys. We can zoom out; we can actually zoom out beyond where we were viewing from and get a much greater perspective on it. We can select, with a pull-down menu, different areas we want to go to or we can simply click down here on some of the other node locations. So the map is interactive, too. So we can spin around here, look at one of the conference rooms, the magazine rack, that type of thing.

So that was a very simple quick walk-through of our facility.

[Tape change]

Rob Gemmell: So we took the lessons we learned in creating this site, this interactive tour, and we looked at what it took us to do this. And what we were able to do, what you saw there, took us two-and-a-half weeks; we had a team of six people assigned to the project, and this was their first time to execute it. It cost us about \$20,000 in time to execute it.

After this was executed we started talking to various clients who were doing an increasing amount of Web work about some potential applications where could embed, perhaps, some of these *QuickTime* VR movies. Apple, at the same time, was working on a deal with Netscape that would allow them to do the same thing. And fortunately, they've been able to work something out, so that you can, in fact, embed *QuickTime* VR movies in a Web site.

Now we had several different clients who were looking for this type of thing. We'd been doing an awful lot of work for Internet MCI. Every two weeks we put together new selection of content for their Web site to keep it updated and fresh. We were working with NBC, putting Jay Leno on-line with real audio monologue bytes, behind the scenes information, and *QuickTime* monologue movies. What we were really hoping to do, though, is do a backstage VR tour a la the Larry Sanders Show — something we knew that people would be very interested in. At the time we weren't able to execute it, but now I believe we can.

The first Web site that I'm aware of that is employing *QuickTime* VR is actually one that was sponsored by Holiday Inn for their Crown Plaza Hotel in Atlanta. And I've actually downloaded a few rooms here, where they've actually embedded *QuickTime* VR. They've got what I call a completely wired Web site, where you can do an awful lot of different interesting things to explore the hotel and learn about what their facilities can do. But they do have these *QuickTime* VR scenes and tours of their suites. I'll give you a quick view of this. If you want to take a look at one of their rooms, you can download this image. One of the great things about *QuickTime* VR is that an awful lot of the files can be fairly small in size. This one here is about 168K, so it takes just about a minute, depending on your transfer rate, to download it. And then you can navigate around the room, and get a real sense for the feel of it, the type of furnishings, space, and how you might feel venturing there.

They've also got a view in here of one of their suites, if that was just a little too claustrophobic for you. And I'll give you a sneak peek at that. After watching these, I have to admit though, I've got some ideas that I would like to suggest that they pursue further. Here you can see that they've got a TV cabinet. Wouldn't it be interesting if they developed that as a hot spot? When you clicked on that TV, you could see what movies might be available on-line, that type of thing. If you click in the kitchenette, you might find out whether they have a self-help bar there, or whether you have to show up with your own goodies, your own bottle of gin, or what have you.

So that was the first interesting application of *QuickTime VR* on the Web that we saw. We've been working with a number of other clients doing some interactive things and exploring what the capabilities are of *QuickTime VR*. One of them is GM, where we've been playing around with some ideas that they might use with their [inaudible]. This is a CD-ROM experiment; basically what we were trying to do is push the limits here. We created what you will see is what we call addressable interface, so the interface is user-definable depending on some of your preferences. The version I'm going to show you is for a person who comes from a sort of a "show-me-more-cool-stuff" attitude, but also for somebody who is more — just wants to see the specs, that frame of reference. And then we sneak in there, of course, a little entertainment.

Now to show you this, I'm going to have to shut all of this down and quit. It takes a couple of minutes for this to load. But one of the things that the team was trying to do here was not just show GM some of the different ideas that we had for how they could demonstrate the product and supply people much more entertaining information about the [inaudible], but also we have this team of people who are really trying to push the limits of the software program, and because we've got programmers on staff sometimes they go in and rewrite the code a little bit, too. And they try to amaze us. So we saw some examples of that here, which I'm really pleased that I can show you today.

One of the things they do after they execute one of these presentations, if they have time, is they go back in and try to figure out how they can re-configure it so that the load time is quicker; and in some cases we've been able to cut load times by 50%.

So here's a quick peek at the one of the interfaces that we've developed. So in this selection here, let's say we're going to look at the [inaudible]. We click on it, and this could be a touch-screen interface, or it could be mouse/cursor driven. And so a panel goes back to review a hidden button panel. And if we click on the option "Exterior" key here, we can pop a very simple *QuickTime* movie that will give us a view of the [inaudible]. Now this isn't an actual [inaudible], this is a plastic model that we assembled and then built for this demonstration. But you can see that you can rotate it and get an awful lot of detail about it. We've actually gone through some models for photographing an actual [inaudible], and I can tell you it's not a simple task — you have to build a rather expensive rig, but we do know how to do it now.

So that's a quick tour, an external tour using *QuickTime VR*, of what the [inaudible] looks like in back and all the way around. What I'd like to do actually here is — now we've got this node also where you can go in and you can take a look at the engine, and then based on your interest level you can zoom in and prompt information and get technical specs and actually call up the manual to learn how to maintain this truck, if you're somebody who is into maintenance and that's your first priority.

Or if you're much more interested in the interior, the comfort of the ride, the experience of driving and spending time in the [inaudible], you can click on the interior. And we've even provided some engine noise here to get a sense for the quietness of it. Can you hear that? Can anybody hear that audio? Can we turn up the volume a little bit? Can people hear that audio now?

Well, let me continue here while the audio is adjusted. I'll just re-launch this. Maybe we'll get some audio this time. One of the best things about *QuickTime VR* is what you can do with the audio. You can assign directional attributes to audio, so that when you're looking in one direction, for instance, you might not be able to hear anything; when you look in another direction you might be able to.

In one of the demonstrations that Apple gave us there was a scene where somebody was on a beach. They do a complete pan of the ocean and then the land; you've got palm trees, that type of thing. And then down at the end of the beach there's a little cabana; if you're standing there and you zoom in on the waves for instance, you can hear the volume of the waves increase as they come crashing in. If, on the other hand, you're more interested in what's going on in the cabana, you can zoom in on the cabana which is way down the beach and you start hearing some tin drum music from the Caribbean.

All right, we're going to improvise here — and then when you zoom in on the cabana even further, you can zoom in at somebody sitting at the bar, and you can actually eavesdrop on a conversation they're having with the person sitting next to them.

All right, I'm going to go through this again — is everybody able to hear that? Great. Now when you go into the interior, we've got what would be the sound of the engine background audio going. Is that loud enough for you? Everybody can hear that? Great. Now you can take a look here, you can zoom in, zoom out on the dashboard, the control area, that type of thing. And then if you want to, you can pan up and take a look at the overhead console, the lights, that type of thing, storage for your sunglasses. Or you can rotate and get a better view of the rest of the interior. We even simulated tinted glass in here. But as you pan to the back, and you notice that the back hatch is open — and what do you know — there's a trickling brook out the back, and you're able to hear that.

And then as we continue back around to the front, you can zoom in and see some of the leather and detailing on some of the interior panels; you can see the drink holder there. And let's say we want to learn more about the stereo system, and maybe the air conditioning system within the [inaudible]. So I'll just click on that, and this is a hot spot that we developed.

Now we've got air conditioning, we've got radio. Just for fun, let's listen to the radio. What we really want to hear, I think, is some driving music. Let's see if we can get some driving music. Tom Jones is, in my view, driving music. This is nice, but it's not quite driving music. And that certainly isn't [inaudible]. And so let's go for the tape — there we go, that's driving music. There's another great song on this tape, too. Maybe I should fast-forward to the next one. Maybe I went too far. Let's see what it sounds like in reverse. That was interesting. Now I'm kind of curious to hear what it sounds like with the air conditioning on at the same time that the radio is on. Can you hear that? The air conditioning is on? That's standard [inaudible].

So that's a quick demonstration of some of the other audio capabilities of *QuickTime VR*, too, which we've been using.

I'm going to go back and conclude the presentation and then if there's time — let me see how we're doing on time. So we've got time for questions and answers here, too.

One of the things that we learned in executing this, however, was that if you really want reality, you need to be able to download these images and project them in a high-resolution mode. All the images you were seeing today were in 56-color format, so 8-bit. Some of the executions that I demonstrated to you are spectacular in a high-res fashion. In the coming year, as Metromedia, in their partnership with Netscape and other folks, *Java 2.0*, and [inaudible] evolve and are introduced, we should have better 3-D capabilities that can take advantage of some of what's capable right now in *QuickTime VR*.

I'm going to jump ahead here to where I was. And I just wanted to do a quick review of some of the issues that we've encountered. And then here's some applications. I don't know if

any of you are working on projects right now where this has some bearing, but these are some that I just thought I'd stick in here just to provoke some thought. Actually, the first one here, Andrew told me about; I haven't seen this one demonstrated yet. But he saw a demonstration of Ticketron where they actually had a *QuickTime VR* movie of a stadium, and you were able to navigate around the stadium and select different seats and get a sense for the view of the field and those various seats. I can imagine how this would be very helpful. In fact, if Dave is here, he might want to talk to Ticketmaster about something like that.

Another idea here is an advanced tour of unfamiliar places. We saw some examples of what one hotel is doing there. Airports, museums, schools — if you have young kids like I do, who are starting a new school and are very nervous, this would be kind of a fun way to warm them up to the idea.

How about a demonstration of the unique features available from a dishwasher? And viewed from the interior?

Another idea here is an arthroscopic dental tour of your mouth, or a real heart. Or an artificial heart.

And then some others here, some that kids might enjoy: the travels of a gopher, maybe a tour of Winnie the Pooh's lair, or inside an ant colony — and that might be something good for an on-line encyclopedia.

So there are scores of other ideas. In fact, I was listening yesterday as Dave was talking about his Web streaking that he wants to be able to deliver next year, and I was imagining what level of detail and reality this could add to that.

In spite of those great opportunities there are some issues. Some of these I've talked about — memory is one. As big as the memory on our computers get, we will always be looking for more. Same with storage space. Internet download speed right now is typically one to two kilobytes per second, so some of those *QuickTime* movies you saw, like the tours of the Holiday Inn, take a little over a minute to download. A little over a minute is far too long for some people. Sometimes your patience is going to dictate that it has to be five to ten seconds. The smallest *QuickTime VR* download file that I've seen was about 25 to 35 kilobytes, So you can get them pretty small, but it was a very simple pan.

One of the things that we've learned when we were helping Apple introduce the *Newton* — which unfortunately hasn't done better, but I'm happy to say that version 2.0, which will be shipping soon, is a quantum improvement. Just for fun, we took an interactive demo of the product which we'd been using in point-of-purchase displays, and we put it on-line with CompuServe and America Online; and in spite of the fact that it took 27 minutes to download, within four weeks of us posting it and doing absolutely nothing to promote it or let people know that it was there, there were over 3,000 people who downloaded it, waited the 27 minutes, went and watched some TV, did some wash, I don't know what — but they waited for it to download and responded very favorably to the demo that was given.

So one of the things we learned was that as a rule, you want to keep these files as small as possible, but if you have something really important that you want to show and it's something people would be genuinely interested in, they're willing to wait as long as you set their expectations appropriately.

Regarding motion quality, I would characterize *QuickTime VR* right now as adolescent but spirited. In terms of resolution it's still grainy, as you saw here, but it's improving, and with every new person who decides to employ it and experiment with it Apple is further encouraged to refine it and put more resources behind improving it. So I encourage you to make use of it as you see fit.

Right now rocket scientists are required. You need to have some pretty fluent Macromedia *Director* skills. It's also helpful if you're fluent in lingo to put together some of the presentations like the ones I showed you today.

And then lastly, the issue of specialists versus agencies. In a sense, this is open-ended. For us it comes down to: are we going to be doing something frequently enough, and have enough of a revenue stream to dedicate and set aside for bringing people on full-time? I know an awful lot of agencies are outsourcing us right now, playing a wait-and-see mode. Quite frankly we've done that too from time to time; although as Mark would tell you, we're probably quicker to jump and commit ourselves to something like this than a lot of other people just because of the people we have on staff and probably the influence of where we happen to be located.

That's basically what I had to talk to you about today. I'm quite happy to see if I can get the Apple store up and going for you, too, if you'd like me to. I've got plenty of time here for questions.

Andrew Jaffe: Why don't we take some questions first, and then if people want to come up at the break, you could do a little demo. Can you bring up the lights?

Oh, by the way, I was supposed to mention there — is Don [inaudible] here? Don, there's a message for you back at registration. Is [James Herring] here? There's a message at registration, I think it's fairly important, so you might want to break off and go get it. I'm sorry I didn't get to you earlier on that.

All right, any questions? Where are we going to start?

M: Given that there's a lot more [inaudible] in the Web, rather than *QuickTime VR*, I'm surprised that you guys focused so much on *QuickTime VR* rather than *VRML* or *VRML+*, or something like that. Could you address how you're picking standards? I mean, I think you're the first person outside of Apple that I've heard call *QuickTime VR* any kind of VR standard, particularly for the Web.

Rob Gemmell: One of our concerns about *VRML* and *VRML+* is that it's basically — what our guys have learned is that there might be some compatibility problems between the two different versions, and we're trying to create solutions that will work cross-platform. *QuickTime VR* works in a Windows environment, works in Macintosh environment, works in UNIX. And so we just see the application as being broader at this time. Six months from now that might change, I don't know.

M: In the traditional advertising model, do you have the copywriter and the art director working together as a team? Does this mean that there is now a third person involved, or is it a different kind of relationship that occurs when you bring programming in?

Rob Gemmell: Actually, we have a number of different titles for people who play different roles in this. In developing the interfaces, we actually have cognitive scientists on staff. People [inaudible] are best known away from Apple, who spends an awful lot of time being very concerned with people's interpretation of environments and interfaces, that type of thing.

The other title that we have, which we didn't have in our other businesses was simply "interactive producer." This is somebody who may not be a designer, they may not be driven by the creative primarily, but they have a really good understanding of the technical limitations and also capabilities; and they have some project management capabilities, too. So producers play a key role.

And then we have people who are interactive designers, and they're people who are traditionally graphic designers, but they've become very fluent in some of the interactive programs and the medium; and they think in terms of interactivity.

And then lastly, we do, in fact, use copywriters in these projects. They put together the story lines and try to keep them compelling. One of the things that we can be guilty of, like anybody else if we're not careful, is we get sucked into the cool visuals and we haven't put enough emphasis on the story, the message, and that type of thing. So we've got copywriters who actually devote themselves entirely to interactive presentations for the sites.

W: Where does the GM piece run? Did you have to pay for the rights to the music?

Rob Gemmell: This piece is not running yet. This came out of our lab and was done two-and-a-half weeks ago. And so this is a sneak peek at something that's not quite out there yet.

W: Music?

Rob Gemmell: Music rights? Well, this is an experiment just to see how it worked, and so I'm not sure what was done there.

M: [inaudible]

Rob Gemmell: We're looking at laboratory solutions, not solutions that are out on the marketplace.

W: You mentioned that there's a couple of helps for — instead of having to rely on a black background for this, that we have the storage and the file size problem, so there's a couple of examples that might allow you to still keep the backgrounds other than black.

Rob Gemmell: That's right. In fact, as you saw in the GM demo when we were rotating the car, we did have the leather-grain texture behind it.

Andrew Jaffe: There's a question in the back, and then I have one or two.

Rob Gemmell: Did that answer your question? I'm sorry.

W: [inaudible]

Rob Gemmell: Oh, the question was: what will we do operationally to reduce file size and still keep the background?

Actually, backgrounds can be one of the biggest hogs of memory, particularly in some of these virtual environments. And so if we really want to cut it down — like we saw in the very first virtual store execution, we had no sky above the store. So that has been one of the techniques. What we try to do, basically, is keep the image area as simple and low-res as possible.

M: So you have a methodology to control production and to control production costs? In my experience, developers want to jump right in and play with something like *Director*. Do you have a methodology to control what the end-product is going to look like, and deliver on client expectations?

Rob Gemmell : You mean just telling them how many hours they have?

M: I mean, if you go back to traditional advertising again, you have [inaudible], you have [inaudible] for television, you have the story board. For interactive, you have what?

Rob Gemmell: We have a defined process that we use that is basically step-by-step. There are certainly some sections where efforts continue in parallel, but we've defined and evolved the process over the last few years that the interactive folks use.

One of the things, though, that you're probably aware of is that because this is virgin territory there's a lot you simply can't predict. And so what we've done is we've tried to set limits on what that's going to be, but we've also asked our clients to buy into that. So when we start one of these projects we usually do it multi-phase. Phase I is just figuring out what we want to do. Phase II is figuring out how much we know about what we want to do and identifying what we don't know. And then at that point, we ask a client to commit to a given budget for what we know, and then for what we don't know we simply tell them that we're going to estimate a range within which we anticipate. But we let them know that we can't guarantee that.

Andrew Jaffe: Correct me if I'm wrong, but from [inaudible] presentation at some of my other seminars, I know that CKS has developed a proprietary electronic job jacket. The job jacket shows the budget and the clock's running, and you call it up, start working in it, the clock's running — you know how much of the budget you're using. You've got three people doing an all-nighter — that's using up the budget. The point is that they also have something where this keeps their timesheets, and all they say that the client pays anyway, and if that's the way it's arranged with the client it goes into a pool that is then distributed at the end of the month, or the end of the quarter. So it's in each person's own interests to keep it under budget. And that's another way of keeping people from just now being able to let go. Because anybody who has worked with creatives in this environment knows that they just want to keep playing with the envelope. Is that generally correct?

Rob Gemmell: That's right. And as a matter of fact, our creative and other folks are encouraged to enter their time on a daily basis, so that at any point in time, an account manager or somebody else can take a look at a job jacket folder and see where the time has been spent, how much remains. We can also track what POs have been cut for outside purchases, and see where that is, too, as the project progresses. And then ultimately predict our margin on any given project.

Andrew Jaffe: I think the question raises the point: it's very hard, from the beginning of this technology, to know how much a job takes.

M: [inaudible]

Rob Gemmell: You know, it depends on how much budget the client wants to set aside for doing that. Sometimes we actually [inaudible] an illustrator, a kind of a map of how the interactive piece will operate with the different stations, and it almost looks like a decision tree. We have done more elaborate versions where we've tied the story board into that with images, so you can actually see the progression. In some instances, we've used [inaudible] to go through a quick story board, or we've used *Director* to put together one, too.

M: I'm curious in the [inaudible] piece why you decided to build a plastic model and not do it digitally. I thought that was interesting, and there must be a good reason for it.

Rob Gemmell: Well, our first estimate for building the rig that would be required to rotate the [inaudible] in space, or position it in such a way that a camera could rotate around it with zero error, was above \$20,000, just to build the rig for the photography. So for this experiment, which was just to demonstrate some of the capabilities, it was far more economical to go out and buy a plastic model. If they decide to pursue this and make a commitment, then we will get the funding to build that rig. And we're looking at ways of doing it less expensively right now.

Andrew Jaffe: Well, that was a wonderful in-depth view of something that we're just starting to become aware of, but I think it's going to play more of a role especially as bandwidth increases and you can do more things on the Internet.

You're all aware that Bill Gates has not only started to buy electronic rights to art around the world, but he has built a virtual mirror of the Seattle Museum, where he's using virtual reality to go into the museum, essentially as a teaching tool; but I guess also an entertainment tool, a social tool. Whatever he's developing there and the programs used there can be used by the rest of us commercially down the road. You might want to comment on that.

And the other question I have is that I mention in the title how this certainly threatens the retail landscape. If any of you are buying into retail real estate firms, then you've got to be asking yourself the question: how much is going to be done in terms of virtual buying, and how much is going to be done in actual strolling malls, and physical buying? Have you done any thinking on that, and do you have any opinions about that?

Rob Gemmell : As a matter of fact, we have. We've all probably looked at Home Shopping Network; some of us have probably looked at the Internet Shopping Network, which makes available over 20,000 different products. Internet Shopping Network is now owned by Home Shopping Network, and they are trying to create, in essence, an on-line mall. They are using some rather straightforward methods for putting products up on screen, which is basically downloading [inaudible] files of products.

So theirs is not virtual 3-D, but we do have another client, they're operating only in Japan right now, they're named [inaudible], and they have developed some compression solutions that allow them to distribute [inaudible] and audio files that are in the same size area where we would want them to be for virtual environments. They have already installed a chain of over 13,000 [inaudible] mini-bars throughout Japan, and you can download any video, that could be "New York, New York," and you can see Frank Sinatra singing it, or you can just look at some interesting scenery and get the text or just the audio and be singing over that. Now they've clearly solved the problem over simple ISDN lines, and so we're talking to them about how we might be able to make something here happen with them.

But if I were Shopper's, or if I were a retailer anymore, and I was thinking about opening a lot of stores, I would carefully consider where I was locating them, because an awful lot of people can do more and more of their shopping on-line. People still want to do the touchy-feely type of thing, but you know, after you've done that for a little while, you kind of get a feel for what something is; and with a program like *QuickTime VR*, if you were to look at a garment and be able to zoom in in high-res mode and actually look at the fabric, and get a sense for the weave of it, a sense for the colors, and then zoom out and see it on a model or rotate around

the model and see how it might fit them — you can be far more inclined to shop on-line and save a lot of time than to actually have to drive out and try it on.

M: I had a couple of questions. Can you comment on — you mentioned earlier about having some people in-house, and outsourcing — whether the control factors are the main elements, or whether it's the perception of the client when they come in and they ask you: well, do you do these things in-house, or do you sub-contract, and who do you deal with? That type of thing. So that you have total control of the project.

Andrew Jaffe: Can you comment on what the defining factors are?

Rob Gemmell: We use freelancers, but we use them primarily when we have a ton of stuff that needs to get done real fast, or when we're shopping to hire somebody and we want to try them out. When we find good people we want to make sure we've got them locked in, because there's a dearth of them out there. There aren't a lot of people who have studied programming and also have degrees in design or are really good copywriters, or have very good project management skills, and are fluent in some of these programs and their capabilities. So when we find one, we want them on board as quickly as possible.

Andrew Jaffe: How do you handle the issues of, if you develop these different functionalities for the Web sites that you're creating, who owns them?

Rob Gemmell: That's a very good question. In some cases we are licensing some of our solutions to our clients.

Here's my personal view: my personal view is not to be pushing the technology just for the sake of the technology, in spite of what I've just shown you. My personal view is to really promote what differentiates you from everybody else out there. If it's that you're creative, then I would emphasize the creative work that you do. If it's a specialty within a certain marketplace, whether it's retail or it's automotive or whatever, I'd play that up. But I think whether it's on-line or in other mediums, I think the name of the game is still differentiation — what makes you stand apart from your competitors.

M: How fast are you growing, and what kind of positions do you find yourself looking for now?

Rob Gemmell: We are actively looking for people who are very comfortable in both [inaudible], *Lingo*, *Macromedia Director*, and *QuickTime VR*, and those types of applications. So I invite anybody to contact me.

M: Do you find you're getting them right out of school, or do you find you're getting them from other agencies, or from somewhere else?

Rob Gemmell : A lot of the people who are working in our interactive group we are either getting from school or we are convincing them to join us after having operated as freelancers. There aren't a lot of agencies that have people that we can steal in this area, so we've been bringing people on board and then devoting an awful lot of energy to training them on what they're doing. And then teaching them marketing, too. We can't forget that this is just a medium, and the content is still very, very important.

M: As you invest in your people and their education, that certainly has a cost. Have you found that you keep those people? Do you contractually enter into an agreement with them?

Rob Gemmell: We don't have contracts with anybody, but we give them a piece of the company and they share in the profits.

Andrew Jaffe: All right. If anybody has any further questions, they could come down front. Now we're going to break for a half-hour, and we're going to try and start the next presentation fifteen minutes early at 3:15. My associate, John Lerner, has just arrived. He's in the back demonstrating Ad Week Online, which is, compared to everything else we saw, pretty pedestrian, but has a good search engine. It does its job. So take your break, and we'll see you back here at 3:15.

INTERNET PUBLISHING: ISSUES AND DIRECTIONS PUBLISHING IN THE DIGITAL AGE



MODERATOR

Jane Dysart
Partner, Dysart & Jones Associates

SPEAKER

Daniel Pelson
Vice President, New Media Productions, Icon International, Inc.

Jane Dysart: Good morning and welcome. I'm Jane Dysart and I'm going to be doing some introductions this morning in Internet Publishing. Our first speaker today is Daniel Pelson, and he's going to talk to us a little bit about publishing in the digital age. Dan is currently Vice President of Icon International, Inc. and General Manager of Icon's new media production. Icon creates, produces and distributes that key component that we heard about a little bit earlier today, content via the Internet. Dan is a founder of *Word*, a sponsor-supported publication which was recently named best non-print magazine of 1995 by *Folio Magazine*. Prior to joining Icon Dan was at Sun Microsystems where he was responsible for incorporating Sun's technologies within the media industry. So with no further ado I will introduce Dan, and please welcome him.

Daniel Pelson: Thank you. Can you all hear me? Again, I'm Dan Pelson, Vice President of a company called Icon, and also General Manager of it's new media productions group. As Jane just said, we are responsible for launching and creating content, as well as joint-venturing with other media concerns to distribute and produce their content. I'm going to try not to make this too much of an Icon pitch; hopefully it won't be an Icon pitch at all, and hopefully we'll cover more of the issues surrounding creation and distribution of content on the Internet.

Before we start, a couple definitions to give you a point of reference. Publishing, what does that mean? Well, publishing means, for the context of this presentation, media properties that are intended to generate revenue on the Internet. We are making a distinction there between something generating revenue versus a promotional site on the Net or just an open site for informational purposes otherwise.

Digital. Digital means a lot of things — CD-ROM, on-line services, the Internet set-up. For the purposes of this presentation, again, I'm just talking about the Internet and the WorldWide Web.

At the end we'll have time for questions that people want to get into, to debate CD-ROM versus the Internet or why we need AOL or all those things. I'll be happy to maybe field some of those questions with you. A lot of you are probably expecting to hear me talk about all the differences between putting out a publication on the Internet versus getting them in print or creating some kind of media property in another medium — television, radio, whatever. My message today is really going to be about the similarities between doing something within this medium versus other mediums. I think we're all caught up, for good reason, in this well-hyped medium called the Internet and the WorldWide Web. I think what we forget a lot is the basis and the foundation for creating content. Hopefully that's going to be the direction of this presentation, and we'll see where it takes us.

To begin with, I think one of the reasons for a lot of the misconception that the Internet is something that we all want to jump onto is because it's easy and really cheap. I can set up a Web site on a service for \$15 a month. It's incredibly powerful, and there's millions of people out there accessing this stuff. Well, in general those things are true.

But again, for the context of this where you're looking to create a media property that is going to support sponsors, that's going to generate subscriptions, pay-per-view or whatever it may be, something that is really consumer-driven, these factors are less significant; in other words, it's not easy, it's not that inexpensive, and although it's very powerful if you do it incorrectly it won't be powerful for you. The message here is of a very well-hyped medium with not a lot of respect for it. So we'll take it through that way, and this is going to be the basis of the presentation here — talking about the pyramid of what has to be considered when creating a presence on the site.

To quote Yogi Berra here, Yogi said, "If you don't know where you're going, you'll wind up somewhere else." I think that's very true in this medium. We work with a lot of clients out there, media concerns that are saying, "we need to be on the Net." And in some cases they have a property that they want to re-purpose for the Net. The first question we always ask is — why? And then we get a lot of blank stares.

The question is, what is the main purpose for launching a site on the Net? What are you trying to accomplish? Who is your audience? [These are] the same questions you would be asking if you were launching a magazine, the same questions you'd be asking if you were launching a television show or radio broadcast. So you really need to know where you're going before you start to consider all the components of going through creating content and distributing content on the Net.

Let's start with content. I'm going to get into all of these in more depth. When determining where you're going, research it. This is something that amazes me — the huge media companies that are launching sites on the Web that would never think about launching a print publication without data-testing it, doing focus groups, researching the audience to see what they want. They're just putting it up there, "Okay, yes, jump on, get into it." It's good for the industry but ultimately it's not great for the consumer. So the same things that you would be going through to launch any other media property you have to consider for this medium. That's one point.

The other issue with the content is that it has to be continually honed. We're going to get into content more specifically, but this is a very dynamic medium, needless to say. Again, with other properties in other mediums, in television or print — I keep saying it over and over again — those properties are continually honed as well, based on the consumer response to it. Magazines are constantly doing redesigning when they see their subscription levels drop off.

You have to be thinking in the exact same terms in this medium. Production, distribution and promotion are often, once again, sort of a belittled aspect of getting content out there. People think, "Oh, build the content, put it up on a server somewhere and everyone can get to it." That's not true. Frankly, it's plainly not true.

There are a number of issues that have to be considered with production and distribution which often become the highest cost of creating and distributing content. And of course, the promotion of it is a complex issue — and once again, we're going to get into more depth [on that].

And finally, the ability to generate revenue. You might actually need a sales force to sell those sponsorships. A lot of companies aren't thinking in those terms.

Now, content. Our producers within Icon have a saying as well; it's no "Yogi Berra-ism," but their saying as far as content is concerned is, "If it stinks, it will stink on the Web." And the point there is pretty self-evident. You have to research this stuff; it has to be good. The key to all of this, regardless of the medium, is compelling content. The philosophy of "If we build it, people will come," is a fallacy. If you build it, people may come. If it's not good, people will definitely go. So that's a process that takes a long time to figure out, how to specifically build on the Net.

Now, regardless of whether you're doing original content — and our organization has launched some original content, including *Word* — or you're building it up in an existing property, whether that existing property is a print magazine, a television show or a franchised character like Mickey Mouse that's an existing property that could potentially have a revenue generating site on the Net, regardless of where that source of content is coming [from], you have to look at the digital medium, in this case the Internet, as a unique piece. Re-purposing, repackaging also has proven not to be the most effective way to use the medium. So regardless if you're taking XYZ magazine which has 60 years of success in the print world and trying to put that on the Net or whether you're launching something completely new and original for the Net, you have to think of it as a stand-alone, separate entity.

With existing properties you do have some advantages. First, successful existing property, a print magazine for example, has already demonstrated that it attracts an audience. It has the ability to also attract sponsors you're assuming, and finally you have the ability to cross-promote from that existing property. But too often it's kind of a double-edged sword; so often existing properties and publishing companies are looking at the print medium as really the source of revenue for that property, so what is happening is they're launching Web sites that are really there just to support the print medium. If that's what you're doing, that's fine — but don't expect that to be a revenue-generating site. That's a tricky issue that a lot of publishers are having a hard time dealing with. What they're talking about, what we're talking about are franchises, media franchises that have the ability to be used in multiple mediums regardless of the medium, but they're stand-alone entities in each medium.

Word for example, right now only exists on the Net. There's no reason that we won't franchise that media property; it sounds far fetched, but there could be a *Word TV Show* one day or the *Word In Print*, or the *Word CD-ROM* or radio show. Who knows? You're seeing it happen more and more with existing mediums. Examples of that are Howard Stern, who has a very successful franchise in his talk show, and he moved to entertainment television to try to re-purpose that content, if you will, for radio. Well, there's no reason he can't, and I'm sure he will re-purpose it for the Net as well, but you have to look at it as a separate entity that will stand and survive on it's own as opposed to something that's just there to generate an audience to a radio show.

The other confusion about how to use the medium is, I think, somewhat understandable. Everyone hears the analogy of the Internet to television in the late '40s, and I think it's a pretty accurate analogy, especially when you're talking about the content. In the late '40s a lot of the television shows were based on radio broadcasts; they were literally a camera focused on the CBS Radio Orchestra for a half hour and that was the show.

Obviously that wasn't the way to use the medium, but we're seeing the same thing in this medium. We're seeing Web sites that are showing pictures of the print magazines on the Net. To me that clearly indicates that something's wrong with how they're using this medium. In fact, what I'd like to do here is actually quickly [move] over to another system

I didn't want to show this one first, but one of these things is not like the other. I'm just going to page through these here, and this is not to pick on any one in particular. Okay, quickly — there.

Now, maybe that wasn't so obvious to some of you, but to those of us who have been doing this for a while I think there's some clear differences between the four sites I just showed you. Three of them had pictures of magazines; maybe it didn't have the title of the magazine on the picture, but it was directly scanned from that magazine. [That's] not an effective way to use the medium. One of them was specifically built for the Net; I think it's clear which one that was. Now, there's an advantage in being able to build a property without an existing print

counterpart there, and we took advantage of that. Again, my point here is that existing properties have to be completely redesigned for this medium. Maybe I'm stating the obvious.

Finally, when creating content you have to educate your contributors. Again, it's amazing to me how many people have done stuff on the Net — whether it's art design or written copy — and have never been on the Net. It blows me away. Every contributor that we have to our publications, if they've never seen it, that doesn't mean that it can't be used in the medium. But we literally bring them in, sit them down and put them in front of a system and say "This is how it works." You can't expect your contributors to be able to create topnotch consumer-oriented content for this medium unless they have a really good understanding of how it works. We're talking about a non-linear environment here, we're not talking about text stories that just run down the page. They don't work. We're talking about using the medium, the multimedia aspect of it and the non-linear nature of it to make content really compelling.

All right, that's my speech about content.

Production and distribution. The point here is — and I'm not going to spend too much time on this, because you can spend a day talking about how to distribute content. The technical back-end of it is to get a Sparc Server 1000 or Sparc Server 20. Well, what's the value of having 128 megs of RAM in it versus 96 megs? T-I's or T-megabyte or whatever — I'm not going to get into that. We'll [have a] discussion at the end for questions and answers, and I'll be happy to field some of those questions if you want specifics. But the bottom line, as I said before, [is that] this is often the most expensive part of distributing content, and under the concept of distribution and production it is not given the time that it really should be given by content providers.

[I want to] talk about some basic examples here, the global nature of the Net. Everyone knows that yeah, it's people all over the world that are accessing this thing.

That means something. That means you have to have a 7 by 24 environment in a de facto way. It has to be up. [With] our publications we have backup and recovery and disaster recovery for all of them, which is very expensive. You're talking about a lot of equipment and a lot of communications gear to make this stuff work. It amazes me when we look at our log reports where people are coming in to see some of our publications. It's an incredibly powerful thing, literally coming in from [everywhere], you name the country. I don't know how they have Internet access out there, but they do. [Inaudible] Island — it amazes me that somehow they have dial-up or something. I don't know what they have, but we have a few fans up there for some of our publications.

What this basically means [is that] you have to maintain this thing all the time. It's 24 hours a day, and you see that from your log reports.

[With] multiple versions, that's a production issue. *Word*, for example, has a version that is for Netscape 1.1, and it has a version that is for non-Netscape browsers; and this is transparent to the user, but that means we're maintaining literally two versions, completely separate versions, and we have a third version that we're now in beta testing for which is a *Java* version. You can see it down in the icon boot. It's transparent to the user, but this means that we have to maintain different sets of content. A lot of it can be re-purposed, if you will, from the *Java* version to the non-*Java* version or from the Netscape version to the AOL version, but we're talking about an enormous task in maintaining the content, keeping it up to date and keeping it relevant between the versions.

Security. Transaction security — there's a lot of hype written about that, [and there's] no question it's an issue, but there are security concerns even for content like entertainment. I don't think any publishing house would let its presses be exposed to a stranger off the street walking in to see what's going on there. You have to be thinking in the same terms. No, you're not conducting transactions perhaps, but you have to be thinking in the same terms that this

has to be a 100% secure site that hackers won't have access to or curiosity seekers won't have access to.

To put a positive spin on it, it's the dynamic nature of the Net. Again, [it's a] a production issue. I'm talking not just content but the "eye candy." The stuff that allows your viewers to know what we call "eye candy," that's something that's constantly changing. Every time they look at that site something's going to change that's going to draw people back and going to make it interesting for them. Again, [that's a] a production programming issue.

New technologies. Again, [another of the] production/distribution issues. How to you stay on top of that stuff? It's very difficult. Go downstairs on the trade show floor and you're going to be amazed at some of the stuff that's coming out: real audio, *HotJava*, *Zing*, there's hundred of things. There's obviously billions being invested in new technologies to make it easier for content providers, but you have to stay on top of it and incorporate it, because they're being thrown out into the field and to the consumer so quickly that if you stay behind you're going to look like — you know, it's not like a print product. If you stay behind, it's going to be obvious. [That's the] bottom line.

And the final issue that I want to specifically address is bandwidth. This is a critical issue. A year ago people were talking about "Do we really need a T-1 or should we go into a shared server environment that has eight other Web sites on it," and "Is this going to be capable?" Now it's the question of "Do we need four, five or six T-1s or should we get right to 10 megabytes?" and "How much is a DS-3 connection," — that's equivalent to 28 T-1s — "and how much is that going to cost us?"

The reason this is becoming an issue is for two reasons, actually. Number one, there's a lot more users out there, which is slowing down response time. In the *Wall Street Journal* today, Nielsen just released its findings on its survey and they are confident that there are at least 17 million people surfing the Web — not with access to the Internet, but surfing the Web. Thirty-four million people, they believe, have access to the Internet, and this is growing very quickly.

This is the first survey that was a real survey in the sense that they weren't serving Web users, they were serving the American household and actually Canadians. So that is obviously impacting the bandwidth issue.

The other thing is now band versus broadband to the home, and this is something you have to be thinking of today. I just came back from a conference where the CEO or senior person from every major communications company — we're talking Time Warner, TCI, the RBOCs, on and on — gave a presentation to an analysts community about where they're going as far their companies are concerned, and every single one of them stressed the importance of the Internet. What they also stressed is that they're investing heavily in bringing very high bandwidth to the home. And you know, this is not that far away. A couple of these companies said that in 1996, mid-year, they're going to just start distributing thousands and thousands of the cable modems.

And they're claiming that the speeds of cable modems — does everyone know what this is, cable modem? They're claiming that the speeds of the cable modem are three megabytes per second. Let's cut that by a third; let's say it's one megabyte per second, and say it's not going to be as successful as they think it's going to be. That still is going to put tremendous, tremendous strain on the content that people are trying to get access to. You have one T-1, which is 1.54 megabytes per second, and let's [there are] just a hundred people out there with cable modems that are trying to access that information — you're going to have a problem. So the message there is to invest now in the bandwidth, because if you're taking it seriously at least you won't be so sorry when the bandwidth to the home starts getting very high-speed.

Promotion — [that's a] very complex issue. Okay, now that we've researched our content, invested in it, built the best distribution machine that we can and hired the best

production capabilities that we can, how do we let people know about the site? That's a good question. I think the answer, again, is to look at other mediums. A magazine would not be launched by a major publishing company today without the investment of millions and millions of dollars to promote the existence of that magazine. Why? The newsstand is a very crowded place, ten thousand-plus publications out there. It's difficult to get shelf space, it's difficult to even get a newsstand to carry your publication. So you have to spend money on the promotion and the brand awareness for that publication.

Well, guess what? The Internet is a very crowded place. It's difficult to get shelf space; in fact it's impossible on the Internet. You have to be thinking in the same terms. You must promote that you exist. Again, you build it, they may come, they may not; that's quite a chance to take if you don't do any promotion for a new Web site.

Now, how do you promote? As I said before, with existing properties you're re-purposing a publication for the Net and you've got an easy promotion channel right there, the existing publication. That goes without being said. Then you have traditional means of doing it: PR, advertising, nothing new. I'm not going to spend time on that. However, that can be a tricky issue.

We lost a Web site that we put an advertisement in *TV Guide* for. Twenty-two million viewers. The site was very active, it was a short-term site, and it was up for two months. We put a survey in there where 2% of the audience said they heard about the site through *TV Guide*, and the other 98% was word of mouth — they saw it listed on "What's Cool" or got an e-mail from a friend. Traditional advertising is important; which medium, where you place the ads, how you use it — that still remains to be seen what's effective. I think things like *TV Guide* will become more effective in years to come, but today I don't know if the *TV Guide* audience was the right audience to get a Web site sent to them.

Then [there's] the digital means. All too often I hear, "Oh, we're going to launch our site and put a link or get a whistle on *Yahoo*." That does not get you hits. You're deceiving yourself if you think you're going to be able to put information in the listing services, all the listing services — and there's lots of them — and expect that people are going to come to the site. Whenever people say that, we say "Okay, what do you think people are going to search on?" "New York, because we're doing a publication about New York." We go to *Yahoo* and punch in New York, and 350 Web sites come up, and we say that's what you're competing with. That's the corner newsstand.

So while listing services, the *Yahoos* of the world, are important and yes it should be there, they're not a way to drive traffic. They are there when people are specifically looking for a topic or specifically looking for your site and forgot the address.

Newsgroups and links. I have a friend who does another Web site downtown, and he's going to put a link in his site. Again, if you're taking this seriously, that's not the way to get traffic. It's just not going to generate that many people going to your site.

How [do you get traffic to your site]? Advertising and PR. In the digital world there are many sites right now which do attract a lot of traffic. They're expensive — I will not quote numbers — to get links in there. But that may be an effective way to generate interest.

PR. Well, there's PR in the print world and there's PR in the digital world. Getting listed in Netscape's "What's Cool," in a sense, is PR. You have to call up Netscape, send your e-mail and promote yourself to them. They don't accept everybody because obviously they get hundreds of e-mails a day asking to be listed there, but it is a very powerful way. It's a source of information, it's public relations that allows the consumer out there to know what's going on. And that's all I'm really going to say about those issues.

Here's the big question. How do we make money? There are three primary ways: sponsorships, subscriptions and what I'm calling "pay-per-view." I tried to come up with

something cutesy for that, but couldn't think of anything. Maybe we'll all come up with a better term. What I mean there is basically paying for specific content: you see that picture, you want it, you click on it and it costs you three bucks. Or you see that article, you read the synopsis, you want to download it: you click on it and it costs you eight bucks or whatever it may be.

The reality is that that aspect of generating revenue is, I think, the farthest behind from the other two. Until things like e-cash or other minor transaction systems come into play it's going to be tough to really collect revenue that way. Some companies, some sites are starting to do it, but I don't think that's going to be the main source for quite a while.

Subscriptions. That definitely is a source of revenue. Sites today are doing it, and there the issues are pretty cut-and-dried. What do we charge for the media, for the content people are getting? You've got to be honest with yourself. What is it worth? You will find out very quickly whether you picked the right number or you didn't. You can look at hits and see how many people are registering once they hit the site, and if they're not either the content stinks or it's too expensive. On the other hand, if you get a lot of hits and you've got a lot of registrations, up the price. It's like anything else, supply and demand and all that stuff.

What I'm going to concentrate on is sponsorships. We are in the United States here, we are Americans and thank God for advertising and all that, but that's where I believe the bulk of revenue — just like traditional mediums, just like print, television — the bulk of revenues can be derived out of that area. So let's spend a little bit more time on that.

The first thing for content providers out there [is that] you have to deal with the ad agencies. I don't want to offend anyone, but it's foolish not to. Yes, that slows down the sell cycle, yes you're dealing with organizations that in a lot of cases — and that's a gross generalization — but in a lot of cases just don't get it. However, if you start positioning yourself with their clients as having the capability to put on an interactive ad for that client, you're getting yourself into a dangerous area. We're speaking from some experience here.

Agencies do have value; they create the message for their clients. We get approached all the time for our publications by the clients who are actually saying "We think this is cool," or "Hey, this brings our audience, we want to put a spot in there." We say, "Great, who's your agency? Let's work with them." Because what's going to happen is that the client is going to start treating you like an ad agency. That's a very, very human resource-intensive process to create interactive ads. So my suggestion again is to try to work as much as possible with the agencies, whether the site exists for a potential sponsor or not.

One of the key things that is becoming apparent right now with sponsorships on the Net is that the concept of "put up a banner and people will click on it" is going away very quickly. I'll show you how quickly this is changing; six months ago that was the case. You threw up an icon, you threw up a GIF image or something, and if the pointer turned into a hand you were guaranteed a click. It was kind of neat to see "XYZ mega-corporation has a Web site on the Net so I want to see what they're talking about." Well, Web users are significantly more savvy today. They don't click. They don't click unless there is a reason to click. My message here is that when you're going after the sponsors and when you're working with the sponsors, you have to be as flexible as possible to try to figure out how to work that sponsor in with content. I'm not saying to jeopardize your content in any way; it can be something as simple as you have a travel section in your publication and it's sponsored by an airline.

That's a pretty cut-and-dried relationship, and there's a reason you're bringing an audience that is interested in travel. Well, the airline makes sense. Again, this is nothing new, this is what's been going on in the print world for a long time, and we're accelerating in that relationship. But you have to be thinking in those terms.

The other thing I have up there is the "site within a site" philosophy. When you're talking to potential sponsors, start talking to them about creating specific content for their site

within your site. Where it physically exists doesn't matter, of course — this is the Net. The message here is, why would a sponsor have a position within a publication that reaches one audience and a banner and a publication that reaches a completely different audience? Even though they might be going after both of those audiences, and it comes to the same Home Page as when you click there — you've got somebody there, you've got that 18 to 34 demographic, you've got women who are on the Net or whoever that content is targeting; build something specific within the site that draws them in even deeper and then maybe send them off if you need to do that.

Again, as content providers you have to be very creative in how the sponsorships are linking within your site. It is a short-term approach just to say, "We got a banner in there and yeah, we can put their icon up with a link for X-thousands a month," because what's going to happen is that you're going to put it up there and no ones going to click, and they're going to say you didn't get the hits you promised us. So that's a no-win situation.

Finally, as content providers our responsibility here is to be able to demonstrate that we're bringing an audience to our content. Again, like any other medium, there are two ways of doing that. There's hits, and they're showing demographic information. Again, everyone is saying that hits mean nothing, hits are worthless. That's bull. Hits do mean something. The technology is in place to measure specifically what people are doing on your site. That's a very powerful thing and I'll argue with anyone in this room that it's a lot more accurate way of measuring how successful content is than any other medium.

You're talking about mediums out there — going back to Nielsen — that measure 2,000 families, 10,000 families for television ratings, and that's supposed to represent 90 million people. Well, with your content you can tell specifically where people are going and what they are doing on the Net. That exists today; it's easily done.

What does a hit mean? That's the big issue. We cannot be focusing, as content providers, on how many hits, but rather what the hits mean. There is a lot of information that can be extrapolated from a million hits per week. You combine it with other information; there's a million hits per week, and that week we had 50,000 unique domains accessing the site. Now you can start to figure out people.

It's still a rough estimate, but you can start to figure out the number of people that you're talking about. The problem is that people say, "Well, a million hits probably represents a lot less people." That's probably true, but it works the other way. There are a lot of on-line services which are becoming much more popular ways of accessing Web sites that cache all their information at the service location, which greatly decreases the amount of hits you're getting.

The bottom line is that we have a story to start telling now about what hits mean, and what I'd like to propose for those content providers in the audience is that I think we have to take the initiative. We have to be proactive and not sit back and wait for a third-party counting service to come in and say "Well, we'll be the third-party verification for you, but say, listen, this environment, this network, the technology is built on open systems and standards." Let's create an open standard, a way of measuring what hits me.

It's not that tough to do. And I would like to offer, pro bono, the services of my company to help make that happen. Right now the technology is out there. The counting software that my company uses for our sites — unless I'm missing something, and I may be — is as technically advanced as any third-party counting software out there. Why do I want to pay a third party just to say, "Yep, we looked at your reports and they're valid." Let's come to an agreement on how we can open up this for the entire industry to make it a fair and equal way of measuring activity.

[They talk about] demographics. "You can't tell whose on the Net, you can't tell whose looking at the site." Of course you can. It's the same way that everyone else does it — you have to poll your audience. You have to ask the questions. You can get some general demographic information from a hit, from log reports, but within our publications we ask the questions. What is your income? And people actually respond, probably as effectively as they would respond in other mediums.

When you fill out the questionnaire for *Vogue* magazine or whatever, we show those demographics to our advertisers. It's powerful stuff — and by the way, the survey information that we're getting back is from several thousand people every month. We're talking about a lot of people. They are pretty statistically accurate. So use that. Ask the questions.

The question then is, how do you get people to fill out the information? People don't like filling out forms, and you have to get creative there as well. *Word*, for example. Anyone can read *Word*, anyone can browse — or lurk, if you will — the publication. But if you want to become a member of the community — that's kind of a happy term for interacting with other people — then we ask you to register.

We're not asking for names, because we're not selling a list. But we are asking for demographic information. And you know what? We're honest with people. We say we need information about you for two reasons: number one, it allows us to understand who our audience is better; number two, we have sponsors here, and sponsors want to know who our audience is as well. People don't seem to mind when you're honest with them. Just saying, "Fill this out and you'll get a T-shirt" — I don't know how effective that is anymore. The message there is don't be afraid to ask the question, because you're going to have to do it eventually anyway.

This is more targeted at members of the advertising community, because the success of the Net is going to be so heavily leveraged by the relationship between content and sponsorship. Whether you like it or not, that's the way it is. I just talked about some of the responsibilities of content providers to show the audience; now I want to talk about some of the responsibilities, if I may, for the advertising community.

First of a few things here — don't fear the medium. Yes, there's a lot more accountability in this medium. You can tell very quickly, in general terms, how effective your creative is. I'm talking from an agency perspective now. If someone looks at the first two pages and doesn't get beyond the next one, that might say something about your creative.

So there is significant accountability, but you have to turn that into a positive. Now, there's significantly more value-add for agencies out there. Number two: the hype. It's okay to [do that]. We all participate in that game a bit, but every week we read about the new Director of Interactive for major agency XYZ, and then we go meet with them and this guy or gal doesn't even have a PC, and the interactive department consists of two people, the secretary and the individual, and sometimes it never seems to be there. And that's reality. That's happened several times and it amazes me, again, how these are major agencies who are trying to position themselves as players in the interactive game, and they're just not taking it seriously. And the reality is that even some of the sites launched supposedly by those agencies are getting built by interactive production houses anyway, with very little input from the agencies. So that has to stop.

Stop the knee-jerk reaction to your client who's saying "We need to be on the Net," because the reality is that the clients are driving this. "We have to have a Web site, so build one for us because you're an agency," and they say "Okay." The next thing you know you have the bicycle tire site, the toothpaste site, you have the chewing gum site and you have the contact lens solution site and guys, it doesn't work that way. I mean, it doesn't work in print that way; you're not going to have the Contact Lens Solution Magazine. You're not going to

have the Chewing Gum Magazine most likely. However, your gum site should exist within that magazine that reaches that young audience that you're trying to reach. This is common sense, basic media and promotion here.

It's basic sponsorship. So stop charging clients the hundreds of thousands or dollars for ineffective sites when you can pay a content provider hundreds of thousands of dollars and make it more effective.

The last couple things I have here... [The first is] strategy. Actually, creative strategy. Every interactive group — not every interactive group, but again, I'm speaking in generalizations and I don't mean to offend — but so many of the agencies' interactive groups are just orphaned children. They are out there and I say "Well, are you working with the media planner for this client on this site that you're building?" No. What do you mean, no? I mean, the campaign has to self-promote, it has to cross-promote here. How can it be so? They just don't do it. That's bad strategy.

[Tape change]

Daniel Pelson: ...incorporate interactive into their overall media strategy for their clients. It's here, it's staying and it's not going away so you might as well do it sooner than later.

Finally, I have the user technology. Again, just like when you're working with contributors to create the content as an advertising agency, once again — I've used this word many times — I'm amazed at how many advertising agencies don't have Internet access, how many advertising agencies have a bunch of stand-alone PCs on the desks and they're trying to create interactive presence for their clients. It's impossible. You just can't do it. You have to understand the technology and use it yourself before you can promote it to someone else.

To basically conclude, we all have a lot of responsibilities out there to make this work — and it's going to work, so I guess it's not so much making sure that we take the responsibility, but who's going to be responsible here.

Content providers have to be responsible for showing the audience. They have to be responsible for taking the medium seriously. They have to be responsible for investing in this technology and investing the time and effort making the content consumer-grade content.

[For the] advertising community, same thing. Basic. Take it seriously, treat it like other mediums, bring it into the house, accept it and raise it, work with us and we'll work with you to mutually beneficial relationship. But the bottom line is that until it's taken seriously enough with the investment, you're not going to get anywhere with it, as a content provider or an ad agency. And that's it. Any questions?

M: [inaudible]

Daniel Pelson: The question is two things. Number one, I'm not saying we move away from the model of sponsorship necessarily; what I'm saying is that we move away from the model of how we use content and sponsors together in the medium. Sponsors are going to have to start thinking about and advertisers are going to have to start thinking about building services within sites, ones built farther beyond the simple "Here's our logo, click on it and you can find out all the ATM locations we have in the city." Build services. Instead of clicking on that and getting ATM locations, click on that and start dealing directly through Internet relay chat with a customer service person right there. Use the medium correctly and create services. That's what going to drive business.

The question about the *New York Times* putting up the *New York Times* for a buck versus buying it for four bucks, I agree with you and I think *New York Times* is probably going to figure out how they're using the medium. And that's my message there.

I'm putting words in their mouth, so I may be wrong, but I believe they're using the medium to help promote sales of the *New York Times*. So you do spend four bucks; but like you just said, why would I do that? *Wall Street Journal* is the same way. I mean, I've got it all there. Just stop buying the *Journal*. Yes?

W: [inaudible]

Daniel Pelson: Right. As a community member we don't call it that because it would turn people off, but when they do register they can interact with the writers and with other *Word* viewers. So basically they're linked into bulletin boards, they're linked to chat sessions, they're linked into special areas that will allow them to interact. The philosophy there is that if you just want to read what's going on and not participate, fine. We don't need to know anything about you. But if you're a participant, if you want to talk to the author with the bulletin board at the end of the story — and virtually every story we put up has a bulletin board at the end of it — then we're going to ask for some information about you. We want to know who is interacting.

W: [inaudible]

Daniel Pelson: We're estimating about 10% to 15% right now. We have to do a better job with the technology, because we're talking about lots of different browsers out there. I think that's one of the reasons that that's been lower than we want, but that's still several thousands and thousands of people. Question over there?

M: [inaudible]

Daniel Pelson: The question is accounting data, how much is automatic, how much is user-provided? The hit reports, the log files that we generate are automatic. Every morning I come to work, go into a password-protected area of our site and see how many people read *Word* the night before and where they came from, and that provides information.

Let's see if I can hit everything here. It provides number of total hits and the number of domains that originated from; it provides the country of origin, and if it's in the United States, it breaks it down by .com, .gov, .org or .edu; it provides a number of some things a little bit more mundane but can be considered interesting to some of us.

How much data was actually transferred? We're getting close to a hundred gigabytes served. Kind of like McDonald's — we'll be there in about a month or two. It's a lot of content. Think about it. That's a lot of stuff.

And then it gets down to which directories have been accessed the most and then down to specific pages. So that's the kind of information that comes automatic to us.

The demographic information where we breakdown male, female, income, occupation, zip code, that kind of stuff, age — I think we ask a few more things there — that's also automatically tabulated based on forms and CGI, but that is the information that we ask for. So when they click on the bulletin board, if it registered it asks them for a password; if it's not then it sends them to the registration screen. It's automatic, by the way. They put in their information and they can start playing. Yes?

M: [inaudible]

Daniel Pelson: What I was referring to was not through the on-line services. I kind of melted and blurred two points together; I apologize about that.

My point was that from the Internet you can gather hits and look at domains served and then start to extrapolate information, because the domain is a unique IP address, basically. Now, the problem with that is a company like — this might be a bad example — but Sun Microsystems might have 15,000 Web surfers on their network, but be coming through one domain name. So it's hard to really get a detailed number, but the message there is you can start to extrapolate. If you get a million hits and five domains, you need domains. You know that you're not reaching too many people. You get a million hits and 90,000 or 100,000 unique domains, you can start to extrapolate that you are reaching more people.

My message about AOL was that it's the same situation as Sun. AOL has two million potential, two million-plus Web surfers on their network, but they're all coming through the same domain name so that shows up as one click in the 90,000 domains, and that [one click] can represent two million people. And we're also seeing it because we gauge what kind of browser people are using automatically, by the way. We ask that question. Most people don't even seem to know, but we also gauge it automatically based on what directory we seed them to transparently, and we're getting many more hits from alternative browsers — which means on-line services to us. That's an important issue.

And by the way, the one last point about that is that you can beat up the on-line services to tell them not to cache your content. They're getting hundreds of requests a day, so they're going to change policy pretty soon because they just can't handle the complaints from the content providers. The problem with that, though, is that it's pretty slow to access fresh content via the on-line services because they're dealing with so many users out there. Question from the corner?

M: [inaudible]

Daniel Pelson: Sure. Before I do that, let me see if there are any other questions. I'll be happy to. Two more questions? Go ahead.

M: [inaudible]

Daniel Pelson: Which files? Is there any further interpretive software for the log files, that was the question.

The software that we're using is a combination of stuff that we basically found on the Net that's good counting software, and code that we're written ourselves. So yes, we use additional interpretive software, but we do more analysis than most of the stuff that's out there. It's not that complex because there's a limited amount of information coming from log files. Again, what I was proposing is that number one, [inaudible] gets together and maybe builds on that software and creates some standard way of analyzing log files; and number two, we open it up, we just make it free and everybody uses it. If your sponsor wants to see your hits, because they're demanding it, here's the password. I'm not saying we share our information with everyone... Maybe that's the way to go too, that you open up that kind of information to the sponsor community.

M: [inaudible]

Daniel Pelson: Let me try to repeat the question. There's a medical journal that won't publish anything in print that was previously available on the Net, and there's economic journals I guess you're working with that may be considering the same thing.

I think that's probably a legal copyright issue, and in fact I think one of the presenters today is from a law firm. You should probably sit in on that and ask that question. My opinion is that it sounds like a little bit of a fear factor. The bottom line is that every one of our writers and contributors and artists — and audio people, for that matter — sign a contract with us giving us exclusive rights to their work for a limited period, and as far as we're concerned it could go anywhere else they want. Whether a print publication decides to use that material or not because it was on the Net, that's kind of unusual, I think. It sounds like more of a legal issue and I'm sorry I don't have a perfect answer for you there. One more.

M: [inaudible]

Daniel Pelson: It's a good question. We ask ourselves that every day. The question was [about how] we spend a lot of time doing content for different browsers, and is it worth it? We're constantly evaluating that. Today I believe the answer is yes. The primary browser out there is unquestionably — and this is not a sales pitch — but is unquestionably Netscape. They're giving it away for free. It's hard to compete with that, and it's feature-rich, no question about it. It allows us to do some neat things too, so we like that.

But as I just said, the on-line services are becoming much more proactive in getting people to surf the Net, because they're getting that billing time. And they have their own browsers. The good news is that most of the on-line services now allow you to use the Netscape on the front-end, but people aren't technically savvy enough to be able to do it themselves. So today we're getting a lot of hits from non-Netscape browsers and we specifically measure that. You can specifically tell how many hits were getting from non-Netscape browsers, and that gives us enough information to say, "Yeah, it's worth maintaining a couple versions." When we see that hit count go down on the non-Netscape browsers or move to another browser, we're going to make decisions on a continual basis. And the aspect of *Java* is another thing. The bottom line is that this is, again, consumer-driven content. We don't want people to see broken images on their Page, so we have to maintain the version. Yes?

M: [inaudible]

Daniel Pelson: Yeah, correct me if I'm wrong, but I'm pretty sure Netscape caches in the disk until you clear it. Not on a Mac though, right? It does it on a Mac, too? Yeah, it'll hold it forever until you run out of disk space, I assume. Is that right? Want to take a vote? Yes. That's right. You might have your browser set to empty your cache every time you log out; we'll have one of our engineers take a look for you.

The next four browsers really don't have specifics, because all we're looking for is Netscape and non-Netscape. It would be pretty easy to tell what they were if we wanted that information, but as far as we're concerned it's the Netscape version, and then the non-Netscape version is lowest common denominator. And if you look at *Word* from an AOL browser or a SPRY browser or a CompuServe browser, it's going to look the same amongst those three. If you look at it from a Netscape browser, all are completely different.

M: [inaudible]

Daniel Pelson: Again, what we do is Netscape 1.1 or above, so anything that's non-Netscape 1.1, including Netscape 1.0, falls into the non-Netscape category. So again, we don't count it specifically, it falls into another category. It wouldn't be tough to do if we wanted to, but it's not important to us at this time. Any other questions? One more.

M: [inaudible]

Daniel Pelson: If you're talking about from a communication speed standpoint, there's nothing that we can do. As a content provider, that's a good issue. I mean, that's why they have to focus on the distribution speed of the content itself, because once it gets to a network access point where AOL hooks into IconNet, which carries our traffic, it's in AOL's hands. So if their network is down, for example, then AOL users can't reach our content. That's the unfortunate fact of life here. Yes?

M: [inaudible]

Daniel Pelson: A lot of cases we eliminate it, we take it out completely. That's lowest common denominator for us in some cases, push/pulls, things like that. Server push, we pull out completely because it just doesn't work in a lot of those environments. Specifically, there's probably less than 30 things that we do and again, I invite you to stop by the Icon booth and maybe sit down with one of our engineers to go over that.

Someone wanted to see the difference here. The thing I was just trying to show here was not that this is poor design, I'm trying to show philosophy of what's going on on the Net. All of these, these are major media companies, in some cases partners of ours, so I don't want to upset anybody; but the message here is that let's say there's a picture of Princess Diana at Time Warner; there's a picture of Diana on *People* magazine, and the bottom line is I would guess, though I may be wrong, that this is to promote *People* magazine. I don't believe, in my humble opinion, that's the best most effective way to use the medium. That's what I'm trying to show here.

Something that you should do if you haven't done this already is start getting more into this and start surfing this, and when you start getting to the actual content you're going to see even more dramatic differences, pages of black text on the gray background versus true multimedia experience that transports the viewer through the content — and that's what we're trying to do, not re-purpose text for this medium and fill in the picture because we can. It's all very intuitive interface.

M: [inaudible]

Daniel Pelson: Warner.

M: [inaudible]

Daniel Pelson: Audio logo.

M: [inaudible]

Daniel Pelson: We're a heavy user of one particular technology right now called "real audio," from Progressive Networks. Every story we put up has original music or sound with it. Some are very short. If you click on one of these things — and this probably doesn't have real audio

playing — this is a talking painting. There's original artwork with original spoken word, poetry with it. If you click on this you could get three minutes of spoken words, but you go to some other stories, like the piece on tropical Morocco, [and it has] has 20 minutes of Moroccan beat with it. Of course, it starts playing automatically so people don't have to worry about the download time — that's the beauty of streaming technology.

[Inaudible] with audio is been pushing it, some of our users will tell us maybe too hard, but we've been pushing that kind of technology within the site, and the good news, once again, is that there's new technologies coming that are going to make it a lot easier.

Jane Dysart: Thanks Dan, and I would urge you all to visit him at booth 444 in the exhibit. Now is a short break, and our next session will be at 11:30 in this room, "Large-Scale Information Retrieval and Dissemination on the Internet."

INTERNET PUBLISHING LARGE-SCALE INFORMATION RETRIEVAL AND DISSEMINATION ON THE INTERNET



MODERATOR

Jane Dysart
Partner, Dysart & Jones Associates

SPEAKER

Bill Phelan
Director, Internet Product Marketing, Dataware Technologies

Jane Dysart: Okay, we're ready to go on the second session of the Internet Publishing track. We have Bill Phelan, a change from the program, who's going to talk about large-scale information retrieval and dissemination on the Internet. Bill is the director of Internet Product Marketing with Dataware Technologies. Dataware is a company that deals with solutions which enable customers to create, manage and distribute electronic information, whether it's on CD, on-line or over the Internet. So, I will turn it over to you, Bill.

Bill Phelan: Thank you. Good morning, everybody. A couple of quick questions before we get started... With the focus of today's presentation on large-scale Internet publishing, I've wondered if maybe we can get started a little bit by asking a couple of questions.

How many people here in the room have Web sites that have over 100 pages of information available to use today? I'd estimate that at about a third. Anybody in the room have over a 1,000 pages of information? And about half that again. How many people here think that as their investment in the WorldWide Web increases they will start to reach those limits of numbers of pages or documents on the Web? Something we're seeing increasingly is that a lot of people are struggling with managing large volumes of content as they take either historical bodies of information or large collections of internal documents and try to put those up on the Web so that a lot of users can access it in a secure, yet easy way.

Today what we're going to do is walk through a quick review of the current state of Web publishing. [To begin, I'd like to] define a few terms to make sure we're all on the same sheet of music, and talk about the climate a little bit, things like what "volume" means today on the Internet, and on the Web specifically. Then I'll change quickly to talk about large-scale Web publishing issues.

There are a number of barriers, if you will. It really makes publishing hundreds of thousands of pieces of information on the Web quite difficult today — or at least not as easy as it is through other mediums. We'll talk about some large-scale Web publishing requirements that I think you should probably consider as you put your strategy together for how you want to deliver information on the Web.

First, before I get too much into the presentation, what do we mean by large-scale publishing?

The first thing I wanted to touch on is what we talk about when we talk about publishing in general. Publishing is enhancing information and integrating various ways of looking at that information. On the left-hand side is the value chain, how you think about data and how you want to organize it and present it to users.

You have disparate information, information from various sources in a variety of formats; as we start to add value, and look to publish that and make it accessible to users in a more easy to understand and accessible manner, we start to categorize that information. We start to screen information, get rid of redundancy perhaps, and rank it according to a certain

scale as to whether it's appropriate for a particular group of users, or perhaps should not be seen by other groups of users.

As we continue to add value to that information perhaps we start to add our own interpretations — editorial content like, “Okay, here is my view of this particular piece of data or collection of data.” We try to profile that information, then group it into useful bodies and make that actionable.

[And finally], we put together a complete solution so that users may quickly find what they're looking for and draw conclusions from the data.

At each step in the value chain, as people organize and make more accessible these bodies of information, there are chances to add value for internal sites that may be simply screening, getting rid of redundancy, or providing a secure, predictable access to that information. On the way over to the right-hand side of this screen, making it actionable requires a far more significant investment. How much time you spend and how you organize your information with respect to the Web or any other electronic publishing medium really depends on what your goals are. Another way to think about the publishing problem, whether it be the Web or any other medium, is to consider what we have constructed here: [an illustration of] a “publishing quality” pyramid.

At the bottom of the pyramid is kind of the state of the general WorldWide Web today, where there is browsing technology and where the browsers are separate from the information itself. There's not a lot of inter-relationship between what the user sees and the presentation in the browser; the browser is not aware of the data itself, but rather simply just puts it up for the user to view. You can not [assign] value on the data side if you're publishing.

But what we're looking for is a better level of abstraction, to build more intelligence so that user interfaces can help users quickly identify what they're looking for and not have to make the investment in changing all of the data in order to accomplish that. [We want to go] a level above the simple browsing metaphor, the surfing metaphor of looking around at these bodies of information in a more narrow niche of application.

[We need] a tighter integration between the information that you're looking at and the software solution through which you view through, and query in, and locate the information that's interesting. From a commercial perspective, commercial publishers get that stuff further. They not only more tightly integrate the software and the information but they do so in a commercial manner to produce titles for sale. And again, where you make your investment and how you organize your information, how you collect that information and present it to your users through your Web site really depends on what your goals are.

Switching this general discussion of how to organize and present and categorize information, or add value to information or add value to data to really make it usable — that's what people are doing on the Web today with respect to large-scale publishing. They're putting up large volumes of information and making it quickly accessible to a particular group of users.

The category of that is a lot of Home Pages, smaller groups of documents where there is a lot of marketing-type literature typically classified as establishing a Web presence. [There's been] a mad rush of: “We've got to get [our] organization up on the Web and at least present some collection of information which describes what our mission is, who we are, how to get in touch with us and what types of products and services we sell.”

Some common criticisms are that there's a whole lot of sex and sizzle but perhaps not as much content, and not as much detailed information on a lot of Web sites that people are looking for. But, as we all know, that's rapidly changing as the volume of information on the Web and the collections of information on a particular subject continue to increase rapidly.

Just to put things in perspective, how much content, how much volume of information is on the Web today? Using some rough estimates provided through a variety of sources that I'll

make sure to give reference to, there is roughly 8.7, somewhere between eight and nine million pages of information on the Web today. That has come through a variety of research, as well as through some of the on-line indexing sources such as *WebCrawler* and *Lycos* and *Yahoo*.

Lycos went one step deeper into their research, and through their indexing has determined that each page of information on the Web contains roughly 8,000 bytes of text. And there are roughly — this is probably in order of magnitude, our [source material] is a month and a half old — but roughly 41,000 servers on the Web. That is outside the buyer service. There's probably — in order of magnitude — a greater number of servers [if you include the ones] inside the companies and inside the corporations, the ones that the people are using to disseminate bodies of information to internal users. This number states the number outside the firewalls and on the public WorldWide Web.

Doing some rough calculations here, it results in the following numbers: as of a month and a half ago, the Web was roughly 65 gigabytes in size. The reason we went through the trouble of coming up with this estimate is because in all essence that's a lot of information that's simply not being — [there are] huge amounts of information that a lot of people who are responsible for publishing information for internal use or for commercial use are used to dealing with. We hear much more of people struggling to present hundreds of megabytes or multiple gigabytes of information.

So the Web, in terms of the publishing of a large volume of information in one site, really hasn't hit that issue yet. With the average data per server roughly one and a half megabytes, if my division is [correct] — but that's rapidly changing. Commercial publishers, through a series of advertising-supported services and using fee-based services, are starting to put up their historical repository of information, whether that's, for example, archival access to large bodies of research or access to the latest and greatest news information from particular periodical publishers.

A different set of information is being published internally to allow corporations to more easily communicate among offices and to establish a better rapport between [themselves and] their customers. And then governments and universities are publishing or making accessible a lot of large bodies of content through the WorldWide Web as well. So we're seeing not just more sites on the Web, but a lot more content, and that's where the issue of large-scale publishing starts to come into play.

What issues are facing large-scale publishers? For people who want to put large bodies of information up, well, there's a series of data issues first. Looking to put up your large collection of data means that you have to look in a lot of different places, whether that's in information stored in different document formats — that represents a challenge — or whether the issue is that you're trying to put information stored in other databases where there are a number of different format issues you have to struggle with. Converting all of your data or all of your document information or collections of data into HTML really isn't a practical step for most people. So how do you manage, or how do you publish information in a variety of legacy formats? That's data issue number one.

Number two is how do you manage the volume, the huge numbers of documents, the huge numbers of records, with today's tools? The size of the documents becomes an issue. A lot of solutions available on the Web — and we'll categorize those in just a minute — have a problem when you start dealing with 50, 60, 70 megabytes worth of information. The solutions simply don't scale.

So then there's the issues of what format the content is stored in, the volume of data that you have to be able to manage, and thirdly, it's finding the right information. But once you have this information available, how do you make it easy for your users to search and retrieve

that data? How do you make an intuitive solution to let people automatically locate the information that they are interested in?

One recommendation when looking at a Web publishing exercise is that you really need to separate the information server concept from your Web server. A lot of Web server vendors have great tools for connecting individual documents and allowing users to gain access to individual documents. The *Netscape*-enhanced and *Spyglass*-enhanced ones do a great job of letting the user click on a link and download a particular document, but they don't really address the issue of storage for large volumes of information. Most Web servers rely on the machine, the file system and the operating environment in which all of those documents are stored to help address some of these problems. As you start to increase the volume, as you start to increase the audience that's going to access that information, you have security concerns and performance concerns and management concerns. So separate out how you want to manage your information and deliver that information from actually just providing Internet access through data.

A second class of issues are infrastructure issues and lots of network bandwidth problems. We've all experienced different latency problems when you're surfing around the Web. That really represents a big challenge for people used to different types or user-friendly types of interfaces to data. To give you an example: if I want to present a thousand documents with 20, 30 or 40 specific categories, how do you let users quickly browse through that category? Well, maybe I'd pop up a list and allow the user to scroll through — and that's a solvable problem today.

As the categories start to increase into the hundreds or perhaps thousands of different categories on the Web, expecting to be able to download all that information to a browser and then scroll through it simply isn't cost-effective or time-effective. It just takes too long to download large lists of things for users to browse through; so there's a network bandwidth problem that is part of the issue.

The other issue — I actually skipped a point — is lack of client site intelligence. Really, the client doesn't know, as we've pointed out before, anything about the structure of the data. The way people access that data is simply by providing a consistent front-end to all varieties of information; so if we could start to add more client site intelligence so that it knew what types of data it was looking for or at, you could start to address some of these usability issues and some of these presentation issues.

I skipped over an important point, and that is server site scalability. As the amount of information increases, as the number of people accessing the information increases, a lot of customers that we've spoken to are starting to run into bottlenecks. As I went from 20 users simultaneously accessing a body of data to 100 users or 200 users, I started to run into bottlenecks in my Web server and bottlenecks in my file-indexing software. So the server site scalability issue has to be one to be addressed as the volume of data you're publishing increases.

The last point is one I've seen discussed in several venues, and that is "stateless" versus [inaudible]. Does this mean anything to people in the room? How many people understand the concept of stateless versus [inaudible]? The Web today is inherently a stateless environment; and what I mean by that is that every time a user issues a query or clicks on a link to a particular piece of information, a connection is established on the server, and the information is then gathered and downloaded to the user and then the connection is dropped. So the server has to go off on a request-by-request basis and do some work and deliver things, and then it loses all knowledge about what the user is doing or who visited the site.

So every time I, for example, go to *Pathfinder*, the Time Warner site, and say I'm interested in this particular news article, I click on the new article and get that piece of data; but

at the point after I got my document *Pathfinder* no longer knows what context or what type of information I'm looking at. If I wanted to find related information, as a user I'd have to go through the steps again and the server would have to go through the same amount of work. There isn't any way to effectively capture knowledge about users and automatically use what they've already done to reduce the overhead on the server side and increase your performance.

So [let's say that, as a server], I get a request and I get a series of documents, and I know what collection of documents that the user has asked for; when the user says, "I want these five documents out of that list of a hundred," I don't have to go and perform the entire query again in order to find out which five the user was interested in.

That kind of wasteful overhead, that stateless connection, is one of the things that will start to bottleneck or present you with a performance problem as the number of users accessing your site and the volume of data that you're giving them access to increases, because there's a lot of redundant work that goes on every time a user asks a server for a piece of information. And all context is basically lost in a stateless environment that the Web has today.

So what requirements should you think about when you're talking or considering putting large bodies of information available on the Web? We're going to run through each of these in detail. What we'll talk about, in terms of production publishing needs, are the needs for a sophisticated database and for searching. It's the idea of value-added presentation, taking it back to the early part of the slides where we talked about adding value to your information and categorizing it better, presenting a clear view to users so that they have clear access and faster access.

As the volume increases there are security concerns. Perhaps not all users should have access to all data. If you're considering a commercial publishing exercise you want to be able to meter that access and perhaps have an accounting interface so you can charge for access to the data. We talked about document formats; one requirement should be to support existing document formats so that you don't have to re-publish everything, if you will, into HTML. You need to consider publishing performance — how optimized is the solution for delivering large volumes of data in a query and retrieval type of environment — and then think about the standards on which the solution you are evaluating is built.

Let's quickly investigate these requirements on a one-by-one basis. When we talk about sophisticated database and searching, lots of people have ways to publish — or index, if you will — content for the Internet today. Some people put in a file-indexing type of product, and basically you can point at directories on your machine that contain your documents and it will extract the data and make it available to users. That's one solution.

However, as you start to increase the number of users and perhaps run into issues of security, think about the scalability concerns there, and also the security concerns. You don't want everyone to have access to the same body of data; you want to have a repository in which you can control who has access to what. A lot of solutions — also, again, on the full text side — only allow full-text searching. "Find me all documents that contain this particular string: Bill Phelan at Dataware." That doesn't do all that much when the user is really interested in only documents that contain that piece of information in a particular section of the document.

Whatever solution you're looking at should support both field searches — "Only show me documents with Mecklermedia in the title, only show me documents with Albert Einstein as one of the site references to that particular set of material," — as well as full text. "Show me all documents that contain Mecklermedia and Albert Einstein," as an example. [You need] extensive query flexibility.

Again, on a sophisticated database and searching side, look to the point of providing users better access and better searching mechanisms to quickly narrow the sets of documents they're interested in. Here are some examples — and we'll talk about them in a bit of detail — but basically, if I know what I'm looking for, they don't make me have to understand a particular query syntax. [You can use it to] automatically, for example, give you the option of looking at a magazine — and magazines, plural — or automatically derive from the query that not only am I interested in magazines but perhaps periodical publications too, which is a synonym for that same term.

Don't make me learn a somewhat archaic query language; let me enter the queries in a natural language format and help me understand the results as they come back. And then the final requirement here is multi-lingual support. If you're considering distributing information outside the borders or [outside] North America, make sure that you're user interfaces and the documents that you put into your databases can be in different languages.

We ran into a customer who made an initial Web investment and put up 50 or 60 megabytes of data, then went to distribute that solution throughout their organization only to find out that their database solution, their information server solution, only supported English-derived languages. It didn't support double byte characters, it didn't support some of the extended character sets of the European languages. So that's another thing to account for when you're looking to publish large volumes to a large audience. Separate how you organize and allow query access to the information that comes back to how you're going to present that information to the user.

What's the best, most effective way to put the user in touch with the data they are looking for? The first requirement to consider is off that subject a bit; it talks about making sure you can store documents of different formats in whatever information server solution you're looking at so that those are automatically converted to HTML. At least there is an initial conversion into the [inaudible] of the Web; you don't have to go and re-author all of your data.

We also ask you to consider different ways of presenting that information, like conditional layouts — hiding information and viewing information depending on what the user is, who they are, and where they're coming from; and highlighting information automatically, allowing configurable controls so that perhaps every time I search through a large body of data I can give the user some feedback. How many documents are left in my query as I'm looking through it? How many bytes per document are there? The idea is [that we could] perhaps give different headers and footers to give users that information. Giving them an idea of where they are and where they've come from is important.

If you're considering commercial publishing, you also want to have control over the wrapper around the documents, [which are] the configurable headers and footers. Deliver different types of messages, whether that be on-line advertising or status and account information, depending on who the user is and where they're coming from.

Here is one representative list of how you can start to think about adding value to your data, some different metaphors you can use on the Web today — perhaps with some additional software — to let users understand the collection of information you're offering them and [let them] navigate it more quickly. Some sites have gone to a "Table of Contents" metaphor, or an "Index" metaphor — "Let me see all of the documents or give me a quick road map to the site or the collection of information available." Some people use hypertext links to navigate through collections a little bit more easily.

For example, not only do I want a link between documents on a particular subject — so that as I'm searching for Mecklermedia or Einstein references, maybe there's a dozen or two that have that type of information in it — then let me jump from document to document; don't make me jump back and forth between the Home Page or the query page and the next

document. Another metaphor that you can use is hypertext within documents. As the documents get larger and larger and you're delivering multiple pages, printed pieces of information on the Web, [you can] provide users a better metaphor to jump within that document, to jump from subsection into subsection or perhaps even from hit to hit. Let me jump from every reference to Albert Einstein. The rest of the document may or may not be important; let me jump from place to place to place, where the subject matter I'm interested in occurs, and therefore give me, the user, the ability to understand whether that document is relevant or not.

There are also other types of software and technologies that can help users find information more quickly. I can use dictionary as a metaphor: "Find all of the terms which mean publication or print media. Give me a thesaurus or natural language interface to allow me to navigate through and find relevant matter more quickly." Some of the information integration options are how you present the information a little bit more enticing. Does the solution you're looking at support in-line images, so I can look at a document and not just have the graphics separate from the content itself, but rather have them imbedded in the document, more true-to-life to a printed page? Maybe [you can] integrate multimedia capabilities, so if there are speaking audio portions of the document you can include those in-line in the information; then the user can not only can read the relevant pieces of data but also click on other types of images and multimedia support to give them a better idea of what's available to them.

In the last one, on the bottom of the screen here, we talk about feedback, and I think one of the most under-appreciated, value-added things you can get to add value to your information is to give users more feedback when they're looking for information and as they're reading large bodies of information. I really think that a Web browser is nothing more than a glorified 3270 mainframe terminal where, while there's certainly a lot of graphic content and interesting things to look at, the user is trying to enter information and get feedback about what they're looking at, enter a query and then receive some results.

It's really almost like a "block mode" environment. I'm entering in information — maybe the query elements, and maybe the questions I'm asking work or don't work depending on how I go about doing my work as a user — and finding ways, perhaps leveraging some of the desktop software that you already have, to give the user an affordance. More feedback, I think, is the next big step we can do, and offering users more effective access to large bodies of data.

A specific example: every time I enter in a state or a zip code, most client server packages and most other forms of electronic medium give me the option of at least automatically seeing what city and what state that zip code pertains to. On the Web today there is no such analogy; I need to enter in all of those elements separately. There is no smarts built into the browsers today. That kind of feedback can make the difference between a user finding what they're looking for quickly, or walking away in disgust because perhaps they gave the wrong zip code for a particular location and they're queries consistently come back with no data as it pertains to their answer. So how you're going to organize the results and how you're going to ask the user, and what kinds of metaphors and control you can give the user to provide quicker access — [those are important].

And finally, there's ways of navigating through the results that really can make an experience of accessing large bodies of data a much more intuitive and pleasurable and successful one for the user. Here's some of the things you can consider when taking the next step: from a production publishing perspective, again, as the volume of information increases and perhaps as the value of the information that you're looking to publish increases, you want to make sure that the solutions that you are considering give you the necessary security, metering and accounting interfaces. Make sure that you can control access at multiple levels. "I

want to be able to lock users out of accessing information at this site entirely," is one example, and something that Web servers do very well today.

I can also very easily lock out access to entire databases or an entire collection of documents. But that really puts the onus on the publisher to organize things on a database by database level; it's much easier if I can have all of my information in one place, and then control access and say that a particular user can only gain access to this subset of documents, or perhaps they can have access to all documents but can only see specific portions of those documents. Perhaps I want to provide all users access to title information and abstracts, but I don't want users to have access to the full contents of the documents unless they've registered on my site, perhaps registered and paid a subscription fee, or perhaps have an account that can be charged in order to gain access to that full content.

So consider those types of things when evaluating a query and retrieval solution, and make sure that the solution also outputs all of the transaction information that you as a business or you as a site are interested in tracking.

Make sure that they not only tell you who is accessing your information but what information they're accessing, when they access it, how much and how long; because those are all elements that can influence a decision about what data to put on in the future, what to charge for particular pieces of information if that's your interest, or where to add more editorial focus if you're inclined to increase the number of people accessing your site.

And lastly, if you're looking to charge for information, make sure that the solution supports a secure Web service, because without that secure browser and client there is no guarantee that people will take and pay for and use the transaction mechanisms out there.

[Keeping in mind all the] other standards is another requirement. Make sure that whatever decision you're making now doesn't lock you in to a particular platform or set of environments in the future. Make sure there is a support for the various flavors of HTML, and therefore for a variety of flavors of browsers, since you want to access the greatest audience. Make sure the Web server support is broad; don't just lock me into the freeware versions, but also [consider] the commercial versions. Make sure that I'm not forced into a particular platform decision. Make sure the support ability is there. And make sure that the vendor is tracking all of the emerging standards, because every week it seems there are changes taking place that affect the way different software works together and the way different publishing solutions can be integrated.

I invite you all to look at one possible solution to these large-scale publishing requirements on the Web. I work at Dataware Technologies, and last week we announced a product called *NetAnswer* which addresses all of the large-scale publishing requirements we just spoke of. We're at booth 212 on the floor, or come visit us at www.dataware.com. And I'm more than happy to take questions.

Jane Dysart: Thanks Bill. Are there questions?

M: [inaudible]

Bill Phelan: Yes. The question was, how do we see the role of *Java* in making the client side more intelligent? I think that people are focusing on *Java* because of the animation and the sex and sizzle, but *Java* has a lot of practical aspects to it as well. *Java* really allows you to put up these different kinds of controls and these different kinds of feedback mechanisms for the user. People shouldn't just look at *Java* and see a sexy, multimedia-type of solution but also something that lets users have that kind of immediate feedback when looking at a large volume of information.

M: [inaudible]

Bill Phelan: How important is the “contained search” content? Again, I’m research [oriented] [inaudible]. Well, that’s what we sell, so we think it’s very important. A lot of it comes down to the different classes; if you want to quickly put a volume of information up on the Web, and don’t have concerns about scalability and performance, there are file-indexing solutions that work very well. As the volume increases you really need to look at text databases, and the search engines on top of those, as the vehicle to deliver and manage and control access to large bodies of data. Does that answer your question?

M: [inaudible]

Bill Phelan: Obviously, a lot of what we spoke of are different ways of searching that information. Textual search is one of the ways, and natural language search is one of the ways allowing people to ask a question in a variety of ways and have other, underlying technologies support that text query. That’s a very important thing, because if people can’t find the information then your publishing it on the Web has no real value.

M: [inaudible]

Bill Phelan: Actually, they’re PDF files. For those of you who don’t know PDF, Adobe PDF stands for “portable document format,” and it’s a way that you can basically take content and present it and maintain it’s presentation. If you have watermarks in the background, column information, embedded graphics, etc., PDF is a very viable way to display that kind of rich publishing format. Embedded in PDF files is the full text of all of the documents, so we have technology that actually allows you to extract the text, make the full text searchable, and then when the user says that’s the information they’re interested in you can download the PDF or set of PDFs the user is interested in.

M: [inaudible]

Bill Phelan: You need software to make that search possible, that’s correct.

M: [inaudible]

Bill Phelan: The question was about what to do if you’re trying to publish across multiple mediums — the print medium specifically and also various on-line mediums, whether that be on the Web, an internal corporation network or on CD-ROM. The strategy Dataware has adopted is to always keep the original document in lock-step with a full text searchable solution. We’ll have links to the original document format, so you can do both full text query things — in order to locate the documents you’re interested in — and get the original representation of that document downloaded to you as well.

M: [inaudible]

Bill Phelan: That’s correct. So we have something that extracts information from a variety of document formats, pulls it in and puts it into our database, and then keeps the original documents and the searchable texts of those documents in lock-step with one another.

M: [inaudible]

Bill Phelan: How viable is it to produce a single database that contains both kinds — your documents for document management, as well as putting those documents available on-line? There's an open-ended question.

Realistically, we don't see a lot of people doing that today. There is the document production cycle that has a specific sets of issues associated with it. It's usually tracking it along the various stages of delivery and production and then, once that document is ready to be published — whether that be via print medium or electronically — taking it out of the internal document management system and placing it in a separate database is the strategy most of the customers we've worked with have taken. A lot of it has to do with concerns over security.

[Tape Change]

M: [inaudible]

Bill Phelan: Do I see the need for sessioning?

M: [inaudible]

Bill Phelan: The question is, as the Web is a stateless medium by default today, should that change in the future? We do see it changing, but in a couple of different ways. For people who want full-time access to data — in other words, if I'm a full-time researcher and I want to constantly access a particular set of data, I may want a proprietary interface, one that basically establishes the connection and keeps that connection because of the variety of benefits that I can give the user that way. I can make response times a lot faster and I can provide much more immediate feedback on things.

For general access to data, to a large audience, if I am not a dedicated user of a particular collection of documents but rather a casual surfer or a once a month user, perhaps I don't have that proprietary interface requirement; but there are still things you can do on the back end, staple types of things you can do on the server side so that even for those users who don't have a dedicated interface, they can get some of the staple benefits.

We can keep some intelligence around on the server side so that for the length of a person's sessions, for the next 20 minutes to an hour, we track everything they do and make sure that we re-use everything that they've done to help provide better performance and better access.

I think we're going to take one more question and then, unfortunately, we need to move on.

M: [inaudible]

Bill Phelan: Yes, you didn't, and there is a whole series of copyright and distribution issues as people gain public access to large bodies of information. [There's] lots of copying; as soon as it's on the Web, it's basically construed as free game, or it certainly has been to-date. There are services available on the Web — there's a company called Copyright Clearance Center and others — that are allowing corporations to at least do copyright look-ups to make sure that they have access and legal permission to copy certain pieces of information or can get that permission. Copyright Clearance Center is located in Cambridge, and they happen to use —

they're one of our early adopters of our *NetAnswer* software, so I'll give them a free plug. The point of the presentation today was not to talk and write about copyright.

Jane Dysart: But there are some other sessions later that will focus on that, and Bill will be here for another couple minutes for questions. Help me again to thank Bill.

INTERNET PUBLISHING INTERNET PRICING AND PRACTICE: AN OVERVIEW



SPEAKER

Patricia Sabosik

Editor-in-Chief, *The Whole Internet Catalogue* for GNN, America Online, Inc.

Patricia Sabosik: I'm Pat Sabosik, and I'm currently the Editor-in-Chief of the Whole Internet Catalogue for GNN, AOL's second brand-new Internet Service.

I was formerly vice president of Linked Media, AOL's Internet Services Division, and I am delighted to be here today to talk to you about pricing and practice and just what some of the trends are that we see going on in the Internet today. This will be an overview of a number of areas that I have identified where we actually have some numbers and some trends, and hopefully [have] some information to help you move forward. Since you're all at a show, incidentally, thank you all for coming after lunch. That's a big deal.

How many people actually are on the Internet today? Just about everybody. That's terrific. How many are on through an Internet access provider? Well, that's interesting. Less than half. How many are going on through one of the commercial on-line services? So the rest of you are educational institutions? Is that right? What am I leaving out? Companies. How many people are on through their corporation? Okay, there's the other third. Thank you. You know, you get into this consumer end of things and you forget — and I come from the academic side of things. So, here we go.

Today, at 10:30 this morning, America Online launched GNN, a separate Internet access service, and we're all pretty excited about that.

These are the areas we'll run through: the arena, what we see today in on-line and Internet services, and sources of revenue and costs.

Some of the things I'm going to outline can be a source of revenue if you're on one side of the fence, but could be a cost if you're on the other side. Take advertising; are you placing? Are you buying? What are some of the products that we see developing on the Internet that are a revenue base? And what are some of the marketing issues involved? Actually, with marketing, we'll talk about quite a bit in the front and then we'll end with some business models.

The interactive services today, for consumers and also for smaller businesses — larger corporations have been using the Internet for quite a while — is an emerging medium and an emerging market, and we look at interactive services as having these four components: the on-line environment, on-line services, the Internet, and CD-ROMs and multimedia, or the multimedia aspect of CD-ROMs and transaction services.

We see a shift from TV and cable to on-line services and the Internet. In a survey by both the Chiat Day Advertising Firm and Business Wire, a joint survey, 65% of teenagers spend more time on home computers than they do watching TV. We see a shift in the consumer end of the Internet market very similar to the cable model about ten years ago, with cable versus TV, where there were some "early adopters." We'll get into that; but we did see a movement away from one medium into another, and that's exactly what we're seeing today.

Without going into specific company figures, there are times during America Online's and CompuServe's and Prodigy's days where more people are signing on than are watching TV. What we're beginning to see is really the emerging of a new medium, and quite an interactive medium as opposed to the passive medium of TV. When we look at consumer adoption and where we are in the consumer end of on-line services in the Internet, these are pretty standard stages of adoption. There is the innovator, and they are price-resistant for the most part. It

maps out to a pretty standard Bell curve, where on the left we have “techno-lust” and on the right we have “technophobes.”

So we have innovators or early adopters, and these percentages, if you move from different marketing textbooks, will vary three to five percent, but not a lot. “Early majority” is the large half of the Bell curve and “late majority” is the second half of the Bell curve; and then we have the laggards, usually when a product is in a sunset phase of its cycle.

Where are we today? On-line services have passed the early adopter stage and we’re looking at a peak of about five million homes, and we’re moving into the early majority stage for on-line services. And that’s America Online, Prodigy, CompuServe, Delphi, Genie, and the Microsoft Network. And all those have Internet connectivity as well.

The mainstream is going to hit at about 35 million homes, and the projection we’re using is based on the number of households with PCs and modems. That figure varies from survey to survey, but there are some pretty standard [numbers]. I think that figure is around 90,000 households. And that would be about right; a little less than half would hit in the mainstream.

5.6 million homes subscribe to one of the big on-line services. They’re in the early adopter phase, and as you can see, crossing that line from five million now to close to six million into early adopters, 53% of homes in the U.S. have modems. This is from Intecho Corporation’s survey of on-line users. Intecho is a Norwalk, Connecticut market research firm. Some of their results were published in a few of the on-line and advertising newsletters and Robert Seidman’s on-line newsletter. If any of you get that, it’s really great just in terms of keeping a pulse on what’s going on in the on-line community. And Webster, for newsletters, and EduPage are good newsletters for Internet-based services.

Again, the Internet is moving. Now, the Internet — we’re not on [the subject of] on-line services anymore. We’re off of AOL and we’re on [to the subject of] TCP/IP. The Internet is moving into the early adopter stage. It’s now represented by fewer than 750,000 consumer households of the consumer market. The academic market probably has an 80% usage rate on the Internet, and that’s the arena that developed it.

The National Science Foundation, with funding from the government, subsidized the Internet backbone in the development of that for the last, almost twenty years, and then gradually withdrew the subsidy and pushed that whole network into essentially a business model in the commercial arena to pay for itself.

So academic research and business use are heavy users of the Internet today. Consumers are just beginning to get involved in that. And then we also see a shift; the biggest activity, the biggest area of action is a shift to consumer-based services on the Internet. On-line services integrated Web access in 1994 to grow the new medium and to capture the early adopter market. AOL announced our second brand today specifically to address the personal Internet market, not the business market. We do have a separate division called Enterprise Services that specifically addresses business-to-business Internet connectivity, but it’s without the programming and the advertising that we see in either GNN or AOL.

I’d like to talk a little bit about revenues and costs. There are four areas that we’re going to look at. Pricing [and] pricing access, advertising, memberships and subscriptions, and some transaction services.

Pricing access is the connectivity phase of the service where we see a trend. Our subscriptions are ranging now between \$5 and \$15 a month and \$2 an hour additional on the Internet side of the fence.

It’s slightly more costly in terms of machine overhead to manage the Internet connectivity than it is to manage the connectivity in an on-line service, and there’s two reasons for that. One is the technical infrastructure required, and the second is critical mass. The on-

line services, for the most part, are enjoying more than a million members, or at least a half-million members, so there's enough of a critical mass to spread overhead costs, to spread the fixed costs of just the computer center. There are just not that many Internet providers or Internet users hooking to on-line services. So, we have those two issues.

We also see a market push to lower prices to move this into the next stage of consumer adoption, and that happens as any new product runs through a product life cycle. The market pushes the cost down — if you're looking at a pyramid — so that we can reach the base of more users. When I did a talk on pricing six or seven months ago at Internet World in April, the subscription prices then were higher, with the average much higher than the \$5 to \$15 range. We were looking at the \$20 range plus \$2 an hour.

So the additional [hourly cost] factor has not dropped, but the threshold to get onto that service has actually dropped about \$5 and I think we're going to see more of that over time. These are just some general pricing [numbers] for the on-line services. CompuServe earlier this year dropped its price, which was a little bit higher threshold, to match America Online, so now they're about the same. The difference between the two services is that AOL is flat fee and CompuServe does have some content surcharge areas, so depending on what you want you can take the same ride for the same cost or you can pay a little more to get into certain other areas.

Prodigy has a slightly different rate, basically a dollar an hour plus about \$2 or \$2.50 an hour for additional [hours], plus content surcharge for some of those areas. The Microsoft Network is trying to drop the bar a little bit; it's \$4.95 a month for three hours plus \$1.95 for additional [hours], plus the content surcharge areas. And there are more of those in the Microsoft Network than there are in some of the other on-line services because of the way they've structured the relationships with publishers so that the publisher has a say in what the access fee will be to get their content.

[Let's talk about] Internet access providers. What we're seeing is the emergence of national Internet access providers as opposed to local Internet access providers. And here are three: GNN announced today, and their pricing is \$14.95 a month for 20 hours plus \$1.95 additional [per hour]. NETCOM is \$19.95 a month for 40 hours [plus] \$2.00 additional [per hour]. Non-prime time is free, and non-prime time is midnight to 9:00 a.m. And Sprite — which is a play on SPRY — [is] CompuServe's Internet access feature. It's a cute marketing name. CompuServe has just announced that at the end of this year, or in early 1996, they will have a separate Internet access service based at \$4.95 per month for three hours and \$1.95 [for each] additional hour.

There are a couple of different approaches here in strategy. GNN and NETCOM are pricing to give subscribers enough time to get an experience, to get a sense of the Net, to do some exploration. GNN has a slightly lower hurdle to get on, a little bit fewer hours, and Sprite is just for dropping that bar a lot lower in terms of the threshold for getting on before you kick into additional hours. So these are just different strategies.

I think you're going to see a lot of market testing and price testing over the next six months before some of this stabilizes for access providers on a national level; and there is a lot of competition at the local and regional level [also], and that will continue. At a national level, what that means is that you can call across the country [as if you're] making a local call, and it's usually a high speed call, a 14.4 or 28.8 call. And if you're moving around the country you can use your GNN account to log in anywhere. GNN is coming out of the box with about 600 "points of presence" across the country. I believe NETCOM has 400 points of presence, which are areas where you can call local phone numbers [to access the service]. They tend to be clustered around large metropolitan areas.

[Let's talk about] advertising and media sponsorships. In advertising, six to eight months ago the top ten advertisers on the Internet were computer companies. What we've seen in the shift during the last six months has been the emergence of a pretty strong consumer brand presence, a consumer product presence on the Internet, as well as a pretty strong business presence on the Internet. So we've moved from Sun and Hewlett-Packard and IBM as advertisers to MCI, MasterCard, and Visa is coming, and America Airlines and a few others. There's a lot.

And there's a site called "WebTrack." They've published an advertising newsletter, and they also have a Web site and a list of the major consumer advertisers. Their URL is www.webtrack.com. Somewhere in that site it will give you a pretty extensive list; I think there's over 300 consumer and professional advertisers with links to that particular site. It's actually a very nice feature. [It has] drug companies, pharmaceutical companies [with a] heavy Internet presence, and advertising in certain scientific areas as well. But the trend is toward sponsorships, and this is pretty interesting for me and for the industry.

The advertising that started on the Net about a year ago was traffic-based, which is [a record of] how many "hits" were coming. That was basically — either that was what the price was based on or that was the rationale for charging a certain amount of money. Now we're seeing a shift as new programming and original content moves to the Internet, and the pricing is shifting away from traffic-based to content-based. Actually, there is both.

Here we can see a move from directory style traffic to sponsorships that are lifestyle-based, and this fits the consumer model. This is where we begin to move in sort of a blending of magazine publishing and cable TV programming; and that [new blend of] programming is used a lot in the consumer end of the on-line and Internet industries because we are creating new content for this particular medium.

AOL has a greenhouse program, and the other on-line services have developer programs where we're actually helping people, giving people the tools to provide and create new content. I'll get into some of that a little bit.

In terms of lifestyle, here's one example in the GNN service. Of course, the default screen is the GNN Web site, which has been enhanced over the last few months to bring in articles written by Paul Thoreau and Jan Morris, who are travel writers. We have interviews with Robert Mondavi, and we've serialized books, some new books, some recently out, some soon to be out. And [we've also] created some other [areas that] we think are pretty interesting and interactive areas; but in terms of lifestyle, we've actually developed some new articles and features that deal with travel, personal finance and sports.

The "Story Cafe" [category in GNN] is for books and literature, both of an interactive nature and of a page-based nature, where we have bulletin boards and chats going on with famous authors about their book or about chapters of their book, and we'll run a chapter [of that book] a month over a series of four to six months.

In "Education," we do some partnering there with other educational publishers and Web Review. Web Review is a magazine of social commentary that actually was created for the Web, and it's authors and writers are some of the early writers for GNN before O'Reilly sold us to America Online. They stayed to create this on-line magazine, and it actually has a pretty good technical edge to it as well as employing a lot of technology. It's one of the most active sites using real audio today.

Now, what are we looking at in terms of prices for some of this stuff? Well, on just the traffic-based sites, the WebCrawler, which is a search service — I guess when we look at some of the directory-based products we're looking at browsable indexes and searchable indexes.

The WebCrawler is a searchable index. It's a spider that crawls, identifies Web sites and indexes them, and then you do a search and it will tell you what it's found. The WebCrawler gets

about 11 million queries a week; that's based on last week's figure. A billboard ad there is \$22,000 a week.

The NCSA *What's New* page, which is jointly published by GNN and NCSA, has a price of \$11,000 a week. It gets fewer hits than 11 million; somewhere in the tens of thousands or hundreds of thousands. And the *Whole Internet Catalog* has been renamed the *Whole Internet Catalog Select*, and it's now positioned as it should be, which is as a selected listing of interesting, content-rich Web sites. That's on the Net, but it's within GNN, and that gets a billboard ad at about \$3,300 a week.

M: Do you correlate the cost of the demand for [inaudible] advertising [inaudible].

Patricia Sabosik: Well, 11 million people see it.

M: See that ad?

Patricia Sabosik: They see that ad, that's correct. So there is some correlation between price and exposure. This month, in September's issue of *InterAd*, which is both the on-line and paper-based newsletter from WebTrack, there is a pretty interesting article about the correlation between the CMP for on-line advertising versus paper advertising. There still is a much more efficient relationship between print ads and reader circulation, reader view, than there is for on-line; it just depends on how we're counting. This is still new.

Here are some others. ZDNet costs about \$40 for three months, and they figure their page requests are about \$1,500 per week.

This is on TechWeb, on sites that can either stay in an area or rotate around TechWeb, and that's a pretty interesting site. If you haven't seen it, go there; they do some very nice things with both their magazines and newsletters, all advertising-based, supported advertising.

M: [inaudible]

Patricia Sabosik: Oh, that means how many people are expected to access the Web page, where that ad appears, per week. The CMP can be somewhat specialized, so they've got a niche audience. They've been doing this for a while and they have a pretty stable readership base in different areas. *Wired* pages [cost] \$15,000 per month, with requests at about \$1,300 a week for that particular ad. *Wired* counts its readership at about 750-760,000 readers; [that information is from] *InterAd* in September.

[On the subjects of] memberships and subscriptions, these are merging and actually moving into the quite developed areas on the Net. They're ways to identify readers, to capture information on usage and to capture demographic information. I'm going to talk a little about that towards the end.

An important way to know who is in your site, how they are using the information, where they are going — a lot of that can be tracked as the browser technology gets more complex and sophisticated and server technology gets more sophisticated. These things can be tracked in a much more rigorous way than they could six to eight months ago. And here are some examples of sites that actually do have membership forms or demographic forms that say, "Hey, tell us a little bit about who you are."

At GNN we've had one since the site began, and that was in 1993. We're an old-timer in marketing and pushing on the Internet. CMP is another site that asks and actually gets a very decent response rate, even though this is all voluntary. These are voluntary ads. WebTrack will ask you for information if you want to access some of its lists, which are for free, but they want

to know who you are before you get into that particular list. It's clever; it's not very obtrusive, but it's there. America Online has a voluntary form to fill out on their Web site. *Hot Wired* does as well. I think you need to do that before you actually get on to *Hot Wired*.

ESPN, also has membership information, and that's actually a subscribed service where most of the sports information is available for free. There is some premium content that is available now for a fee, and I think the fee can run up to \$30 or \$40 a year for the threshold plus additional dollars per hour. You will see more of this as restricted access becomes possible where it didn't before, and as security — whether it's the Netscape-based SSL, [which stands for] "Secure Socket Layer," or secure HTTP — becomes much more pervasive, you will begin to see more of these types of services developing because information providers would like to get a little money from this medium. As more commercialization moves forward to the Net, we will begin to see more of this.

"Transaction services" is another revenue area or cost area. This is very much an emerging business, with Internet banking and electronic cash, where the bank takes a percentage of the transaction fee as a handling fee or an overhead fee. The security that's in place today, as I mentioned, is new. Most of it came out of the [Teresa] joint venture between the major on-line services and Netscape, where both agreed to adopt the same standards for security; and they're there. They're in most of the commercial browsers and also beginning to be implemented into both the commercial on-line and Internet services. And all that does is lay the groundwork to be able to then say, "Yes, we can have a secure transaction. Yes, I can take your credit card over the Internet or I can send a confidential message. I can send something that's secure over a public medium."

DigiCash just announced their service working with a bank in St. Louis to set up commercial transactions using their file. You basically set up an account with an up-front deposit, and the things are debited from there.

M: [inaudible]

Patricia Sabosik: Oh, small: one percent, two percent. That will probably be all over the board. They're lower than the current credit card services, but I think we're going to see a lot of variation before that settles down. The toolkits to develop this technology were just released over the summer, so really we're just in the infancy stage on this right now.

Here are some products that we can begin to see that can be revenue-based, and can definitely be service-based. I guess we can look at revenue. [These products are] either providing revenue directly, or it's keeping someone connected, and that's providing a revenue stream. And they are original programming, news services, personal Home Pages, and community-based services — and this means an interactive, on-line community, not necessarily for your neighborhood, but then the definition of neighborhood is changing as well — and hosting services. I just wanted to run through a few of these.

When we talked about original programming, the GNN Voices have content that was written specifically for this program; and if we consider this an on-line magazine, then these stories and interviews and interactive areas are specifically designed to reach a certain readership. *Hot Wired* is designed to reach a certain readership; there's a hipness to it, an edge to it. There's an attraction for a certain demographic group.

Sports Network, which was just launched about a month ago, is a joint venture between the Sports Network and WAIS, Wide Area Information Servers. It has real-time news feeds and sports scores running all day long, plus news stories, plus pretty deep stats in a bunch of different areas that don't exist in any other medium. It was pulled together to be a specifically on-line broadcast tool, and it's pretty neat. And *Web Review*, which I mentioned before, has

social commentary, technical commentary, and education. They focus a lot on the higher-ed market and college students, and what's going on there.

What are the technical issues and social issues involved with that, and with those writers who are writing and dealing completely in an Internet-based environment?

Before I go into the news services in AOL's greenhouse, [I want to mention that] Microsoft has a developer program, and CompuServe has a developer program, and they're also designed to help creators, authors and developers create new material for this new medium.

Now, about news services; they are very much a growth area on the Internet, and pretty exciting as well. I think more than 50% of the country's newspapers today have a Web site with news content on it. News Pages is one pretty good example, published by Individual, Inc. It's a subscription-based service where you can search in different areas and get current information. It focuses on the hi-tech computer interactive industry, so it's not general news, but it's there.

The Crayon Experiment... I don't know if any of you have heard of Crayon, [which stands for] "Create Your Own Newspaper." It's being run now as a research project, out of Bucknell. It's got 10 or 12 categories, and within each one of those categories is another ten examples. You profile the order [in which] you would like to get your information and the sources [from which] you would like to get your information; they'll store your query, and you just do a reload every day and you get your news packaged that way. It's pretty neat. You miss stuff you don't want to see — like sports, you know, I may never see — but it's an experiment.

As I mentioned, newspapers... More than 50% of them are on [the Internet]. *San Jose Mercury News* does a good job of getting news from the Silicon Valley area on the Net. *InterAd* monthly. CMP does a nice job of publishing their newsletters and some of their magazine information. Ziff Davis as well. *The Washington Post* with digital ink, that's going through Interchange. So we can see a lot of information-based services moving through on the Net. It's a nice medium, doesn't require a lot of graphics. Reuters New Media [is] also very active in pushing its content onto the Internet. These are two people who have licenses to Reuters who are bringing news feeds directly into a Web site: GNN and *Yahoo*. There might be more; I think Reuters has about ten Internet-based services licensing their content, possibly more. AOL and the major on-line services have it as well. It costs money, but you'll begin to see that pop up on other Internet sites as well.

[Now let's talk about] personal Home Pages, the fun part of the Internet. It's a developing communication form, and I say somewhat jokingly that it's a communication form, but in a way it is because it definitely is a form of personal expression for people who are exploring a new medium. There's an emphasis on interactivity and definitely on personalization. And this is an area that is another characteristic of the Internet as it moves into more of a commercial service. If you're thinking of developing programs or publications for that, personalization is important. Also, if one of the ways of measuring your revenue is connect time — which is one of the underlying measurements or principles behind both the on-line services and the national Internet-based services — we make our money the longer people stay on-line, [rather] than just having something that they can go back to time and time again. This becomes an important service as we grow our communities.

GNN has had an area for personal Home Pages and for personal links for over a year called "Nedisons," and that area will be enhanced with the ability to create personal Home Pages using NaviPress, which is another AOL technology. NaviPress allows you to author directly to a server without knowing HTML; you just sort of click and go there. Click and save and there it is. NaviPress and NaviServer also have their own hosting service, primarily for small to medium-sized businesses, but that's a feature where other services will have this as well.

The community aspect of it is important. [What is] definitely important in terms of Internet marketing and the big issues is identity. It gives people an identity. "Yes, I want to be part of this particular community and that particular community. I want to be part of the *Hot Wired* group because I'm hip. I want to be part of the GNN group because I'm a thinker. I might want to be part of the *Web Review* community," and so on.

Security. Can your community-based communications be secure? Can you send secret messages to people? Can you send secure messages to people, beyond just financial transactions? What about personal communications?

Granularity. How specific can you get? Let's say that in my neighborhood I want to talk to women in their forties who have one child and who went to graduate school. Well, that gets pretty narrow in my particular area, but I might want to find just that particular group, and you can go that [way] in this medium. You can do that very easily in this medium.

And then there's the interactivity, and that's becoming more and more important as people are reaching out in this medium. Some of the examples are "Chat" and "Bulletin Boards." I think we're going to see more personal services that are less on the seamy side and more on the sort of interesting side. Match.com is a good example; they guarantee anonymity. They've got a whole series of checks and balances and security in place to do that, and they've been pretty successful so far.

[Now let's talk about] audience and survey time. I'm going to run through about six surveys that are either in the process of being conducted or have been conducted. And let me just say, before we get into some of the specifics — because I'm not going to get into the specifics of each survey — but what's interesting from a marketing perspective is that we're now at a point where taking these kinds of surveys will provide some meaningful information. There is enough of a critical mass of users on the Internet, either business related or consumer related, that can give you a valid sample of what they're doing. At this particular point the pulse is being taken by a lot of organizations, and that's pretty interesting.

Yahoo had 63,000 respondents to their Web site on-line survey, and Jupiter Communications is publishing that. O'Reilly and Associates is in the process of a multi-phase Internet-user study. Highlights [of that survey] are that 66% [of respondents] are male, ages 18 to 44. The Times-Mirror Center for People in the Press conducted an on-line survey, and those results were published last month. [That survey showed that] 53% use e-mail at least one time, once a week and that 30% use on-line and Internet services for news. That correlates directly to what we said before, which is that news is an emerging area. Intecho Market Research Company has published a survey on the number of households that have modems and are using on-line services. [A survey from] Simba Information [showed that] 80% of users are willing to accept the Web as a commercial medium. Now that's pretty good; that's a pretty good test and it gives you an idea of where we're going.

When the National Science Foundation began to pull back its subsidy, there was, I guess, a culture clash because most of the users were academics and didn't want commercialization to run through [the Internet]. So we've definitely seen a mind shift there...

Women are a growth area in terms of using the Internet and on-line services.

DataQuest is in the process of summing up its study, but they found that 60% feel that security is very important and this will lead to more information on consumer transactions.

CNet deals with computer and technical issues and so it's no surprise that 92% of their users [in their survey] are male. 62% [of the respondents] completed college. Throughout all of these surveys, what we see is highly educated people earning in the average range of \$45,000 to \$80,000 a year; so we're definitely in the high-income end of the market, and that would also map directly to the fact that we're shifting from that innovator to the early adopter market. The innovators are not price-sensitive, so we're seeing the swing into more of the mainstream.

Chiat Day has coined the term, “screenagers,” which is sort of cute.

In marketing it's important to have an outline, as you're looking at both designing a product and trying to sell it through this new channel. Is the content “Webcentric?” Is it Web-oriented? Is the context of the content interactive, and how are you placing and positioning your content on the Net? Does it have a nice design flow? Does it have some original material to it? What community are you reaching now that we're beginning to get some demographics on all this? Who is the community? How are you designing your package to reach them? What's the commerce component? Is this for free? Is it being subsidized by advertising or subscriptions or both or is it just being sponsored completely by another organization? What's the connectivity? Connectivity can mean the other people or groups you are connecting to, or [it can mean] how you are getting there. Is it on your server? Is it on someone else's server? Are you hosting it? Is it part of a larger group? What's the cost to get on, and the cost to handle this?

Here are a couple of other summations on the marketing end. [Regarding] distribution in the early adoption stage, use OEM strategies to expand the installed base of technology so that you can actually have something there to use. How many people have gotten a diskette from Prodigy or AOL or CompuServe? AOL “carpet bombs,” you know; that's one way of doing it. This fall, this holiday retail season, every computer that you buy will have at least one on-line service burned into the disc, burned into the hard drive. You have the option of deleting it, but they'll all be there. The on-line and Internet service companies are looking at ways to create an install base so then you can say, “Okay, now I'm going to use that.”

And they're doing it through technology, with PC bundling, modem bundling... You buy a modem; it either comes with a free offer or something is burned in. Custom browsers link to a Web site. The NETCOM default site is the NETCOM Home Page. Volkswagen is using, I think, *Mosaic*; they've bought a certain number of browsers. It's on a diskette, and you get a certain amount of service, but the default Web site is the Volkswagen site so you get to see their new cars. It's a limited promotion just to see how that plays. Compaq does that with other browsers, and you'll begin to see more of that as well.

And so what are the business models that are really emerging in this new medium? Magazine publishing, specialization by subject, by lifestyle, by niche, TV and cable programming and distribution — because you're working in some ways with broadcasts and in others with “narrowcasts” where you can broadcast to a very wide audience, millions of users if they choose to come. Just like TV or narrowcast, [you reach out] specifically to a group who knows that every Monday at 10:00 people like them will come and chat or people like them will come and use this.

We have a little bit of that as well, and [we also have a type of] syndication where sites can be licensed in certain different areas or certain different other Web sites and other services. The early days of syndication are developing right now, but that will grow over time as well. This is my ending screen: gnn.com. Mission arrived... You won't be disappointed.

Thank you very much. We have time for some questions.

M: [inaudible]

Patricia Sabosik: You have a property that runs in different Web sites but you don't change anything, like Reuters syndicating their news. “Dilbert” is syndicated, both in paper and electronics. *The Web Review* — that magazine is going into syndication, so it will possibly be hosted; we're looking at that hosted on different Web sites. GNN is hosting their own version of *Yahoo*, so *Yahoo* is looking at syndicating it's indexing. They're soon to be on CompuServe as well.

M: [inaudible]

Patricia Sabosik: With the hosting services today, the pricing model for that is based on size with a component of usage. Usually it's 5 megabytes, 10 megabytes, or a 100 megabytes, so it's mostly storage; and then, assuming that that size of a file will reach an average of 2,000 hits a week or 3,000, there's usually a premium charge beyond the threshold of so many hits.

M: [inaudible]

Patricia Sabosik: Oh, actually I see that coming very soon. One of the small business growth areas is something that we call SOHO, Small Office and Home Office businesses. There are going to be services designed specifically for them, I would say within three months.

M: [inaudible]

Patricia Sabosik: I don't, but you can get them from those specific Web sites, and you can find a list of those Web sites in the September issue. You may have to subscribe to get it but most of those companies will post something about their surveys on their Web site. O'Reilly is already, TechWeb, CMP is posting, Yahoo posts, and Hot Wired will post them as well. Chiat Day won't; you have to buy that.

M: [inaudible]

Patricia Sabosik: Oh, you probably could find it on that site, and there's a few companies here that are providing hosting services. You should go there and just ask them. NaviPress is one. It's called NaviServer, and they're out in California. There's a few other services that actually will do hosting for you.

Gutenberg

M: [inaudible]

Patricia Sabosik: Oh, a new Intel chip. Well, the smaller information access providers might disappear. To be candid, the consumer side of the Internet is reaching a mass market. It's a numbers game, and so larger [companies] will be able to amortize a lot of fixed costs over a lot of people, which means at some point — right now they can't compete with the smaller access providers, but within a few months, six months to a year, I think they can. In that case they may put the smaller access providers out of business. WebCom is the company in California that does a lot of hosting, and they do a nice job with small businesses and personal Home Pages.

M: [inaudible]

Patricia Sabosik: It's possible, but I think you're going to see more customer service aspects built into national providers just to try and compete at that level. You may still have the competitive advantage on price, I'm just not sure how long you can hold that.

M: [inaudible]

Patricia Sabosik: I don't think it would be profitable in the long haul because the technical support to maintain that isn't the core business of an agency; but getting something up and

going for three to six months is a very natural thing to do and there is some profit in that. I think an agency would need to build to a hands-off point at some point in time. The critical mass of Web sites that you get up puts you into that server forum environment. You've got security issues 7 times 24, and maintenance issues, and it gets really expensive really fast.

M: What kind of ratio [inaudible]

Patricia Sabosik: Modems to subscribers? With GNN it's one. With NETCOM I think it's one as well. With AOL there's an overhead, and I think the other on-line services...

M: [inaudible]

Patricia Sabosik: Yeah, it can range anywhere from \$1,200 to \$12,000, depending on how complex you want it, what you're hosting it on, what kind of a design element is in it, and who does the HTML and how big it is. Is it 100 pages or is it 200 pages? I worked with a small group of academics to put up a Web site of about 50 pages that's going up soon, and we did the HTML and it cost us about \$600. Somebody else is hosting. So, that's sort of the [cost] range.

It depends on what you're trying to do. Once you add a lot of graphics, image maps, and CGI to get interactivity and to collect that, that server where you're hosting it has to be configured for your CGI scripts. It has to be configured for the image maps, so putting it on your local file is one thing, and getting it to the server and getting the server to recognize it and then having people be able to click in... It just adds different layers to it.

And in this medium, the salaries right now — as we're shifting — still have that technical edge to them so they tend to be a little higher than they would in the traditional publishing industry or graphic arts industry. That will change, because as the market pushes the price down it will push those salaries down as well. Does that answer your question, sort of?

The question is, if people are very skilled at Web site design, what's their salary? I said between fifty and eighty [thousand dollars]. Price per hour? It can range from about \$50 an hour, to \$75 an hour or higher. It's pretty high. A lot of agencies are moving into that business as well.

Thanks a lot.

INTERNET PUBLISHING PRICING AND PRACTICE: A PANEL RESPONSE



MODERATOR

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SPEAKERS

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Matthew Shevach: I'm Matthew Shevach and I'm from iWORLD, Mecklermedia's Web site, and I'm responsible for our market development. I'll be here to answer your questions regarding anything from advertising sponsorships and developing marketing plans to general pricing questions on developing Web sites and costs and revenue [inaudible] related to developing Web sites. Tristan here is also from our iWORLD. We're missing one panel member, Joel Maloff. He should be here soon. Let me pass this over to Tristan for a second.

Tristan Louis: Hi, I'm Tristan, publisher of iWORLD, which is Mecklermedia's Web site. Obviously, we've got all the bases loaded between Matt and I. We're going to try to answer all your questions on essentially how much it costs to run a Web site. We'll be happy to entertain any of your questions.

Patricia Sabosik: Let me start by asking you a question. One of the things that came up in the last meeting.... [By the way], I'm Pat Sabosik, Editor-in-Chief of the *Whole Internet Catalog* from GNN, AOL's new Internet service, and I recognize some of the faces here. I just spoke before on pricing.

In the last session there were, at the end, some questions on what it costs to develop a Web site. Do you have any numbers, or a sense of what sort of formulas you could put on the ratio of complexity to the number of pages?

Tristan Louis: Well, it all depends on the extent to which you want to develop your Web site. Developing a Web site can cost anywhere from about \$10,000 to several hundreds of thousands of dollars, depending on how extensive you want it to be. We just went through a complete redesign with ours and went easily into the six figures.

Matthew Shevach: I think one component that's going to raise the cost of your Web site a lot, and I think Pat touched on this in the session before, is in terms of the complexity. If you want to do something neat that's going to require access to your CGI BIN or things like that, if it's not just an out-of-the-box solution, [inaudible] require some servicing, some man-hours from your access provider or your service provider, that's going to raise your costs significantly. There are a lot of service providers that will give you an out-of-the-box solution. If it'll just be giving you space, access or directory, or just going flat content, it will probably be pretty cheap. They're going to price you based on how much size, maybe based on how much access. But if you're really looking to do something that's interactive in the sense of producing pages on the fly or producing queries from a database, it's going to cost you some more money and you're going to have a little bit more development. It would also pay to try and bring some of that stuff in-house because you're most likely going to be paying hourly rates to a developer to do that.

M: [inaudible]

Tristan Louis: Okay. The question is, do we recommend UNIX or NT? It all depends, once again, on what you want to do. Historically, the Internet has been a UNIX-based platform, and as a result most of the tools right now are running on UNIX systems and are being developed for UNIX systems. However, not all UNIX systems are alike. Sun has very much of a lock on this industry, so usually if you want to go with UNIX-based, you might want to consider them as taking the lead.

Windows NT is a product that is gaining some ground. Microsoft has been pushing it hard and is planning on pushing it even further with *Blackbird* which is the new authoring platform for the Microsoft Network and eventually for the WorldWide Web. And we could see NT become a very strong contender in the very near future.

M: [inaudible]

Tristan Louis: Well, at iWORLD we've taken a very different approach. We haven't gotten into a platform-specific architecture. We actually run NT servers, Solaris, AIX, different flavors. It all depends on what you want to do, how strong your database is. There are a lot of database engines such as Oracle and Sybase that work very well with the Web, and those companies have been pushing really hard for those to be fully compatible with the Web approach.

Microsoft is currently working on developing a set of tools that will allow you to access their sequel and its access database. We're still not at the point where we're doing database access, which is why you guys haven't been able to do registrations on-line, but we are seriously considering it.

M: [inaudible]

Tristan Louis: We haven't made a decision yet.

Matthew Shevach: We're using a flat-file UNIX database for most of our applications right now. One interesting development is Oracle; I think they're going to do a press release this afternoon. We'll be shipping an Oracle browser, I think it's called *Power Browser*, that will include an SQL library with their browser.

This really identifies a trend in terms of Web publishing from the flat pages, just HTML, to a more dynamic type of page. The FedEx site would be a great example of this, of pages that are created that have never been created before. You're going to enter your tracking number, your destination country or city, and you'll know how the page created the track on your package. This is coming from their existing corporate database. They're not designing a new database, dumping data in there and tying that to their Web site; they're actually typing a front end to their corporation through the Web, and that's where Oracle's trying to go, I believe, as well with their announcement they're making this week.

Patricia Sabosik: I have an answer to some of that. The GNN Web site is also UNIX-based, but we have a number of our properties sitting on WAIS, indexed by WAIS, and we're using WAIS as a query front end and also as a way to manage some of the data, particularly in our directory areas. Verity is another. Oracle and Sybase are big, industrial strength packages, so if you don't have a lot of content, it won't work. Verity will bring you down to scale.

M: [inaudible]

Patricia Sabosik: The question is, on platforms, how does OS/2 compare with UNIX and NT?

Matthew Shevach: I think that largely we were talking about server software for platforms, and OS/2 really doesn't exist in terms of the server platform, as far as I know. I don't know anybody who's using an OS/2 server. IBM's UNIX AIX, they have a server platform for that and we've actually been using that for some time. OS/2, on the client's side — they do have browsers, I think, Netscape has reported to OS/2. IBM has their own Internet explorer and you can, of course, run your Windows applications through OS/2, so that's not so much of a concern. Does that answer your question?

M: [inaudible]

Tristan Louis: Well, *WarpConnect* was a platform for OS/2 to be able to serve the Internet. They never really expanded it to a full offering and page-serving set. With last July's announcement by Lou Gerstner that OS/2 wouldn't be supported on the PC platform — I don't want to speak for IBM, but it looks very doubtful that IBM will support OS/2 as a publishing platform.

Patricia Sabosik: That's right. I think they admitted that they lost the desktop battle and it's primarily Windows and some Mac users.

M: [inaudible]

Patricia Sabosik: Well, I think in terms of the on-line services that Macintosh represents — depending on the service — anywhere from 20-30% of their users on that, and it's not dead yet. I think that with their plans to license their technology they're moving into at least holding their position, and I see them holding on for quite a while. Not on the server end, but definitely on the client end and as a desktop solution.

Tristan Louis: Well, I beg to differ. On the Internet, I think Macintosh has some huge potentials. They've been rolling out PowerPCs like crazy, with HTTP servers and a set of [inaudible] and CGI BIN programs that allow for anyone to use a Macintosh as a Web server.

Patricia Sabosik: So this would play into their new strategy to change everything to be "Internet-centric."

Matthew Shevach: I think the Mac, generically, is a lot easier to use. On the server side you can do some easier things, I think, with the Mac in terms of scripting for your CGI using *AppleScript*. It's certainly a lot easier to use, and there's some nice servers for the Mac. The WebStar server, some servers out of StarNinetechnologies. So I wouldn't write it off yet.

Patricia Sabosik: Have you looked into 4D as a database? I built a database on a Mac platform, an Internet directory of about 20,000 sites with multiple descriptions and three or four levels of headings using 4D, and we ported to UNIX, wrote an HTML script converter and published to the Web pretty seamlessly and very nicely. And it was an easy system for four or five editors to manage the content and to update very easily, or by its re-service bureau.

Tristan Louis: Yeah. UNIX requires a lot more support than a Macintosh would, unfortunately. UNIX was originally designed as an open system to make it possible for anyone to get into the system. Unfortunately, that means that it's also been open to hackers, and if you don't have a full-time staff really writing your UNIX system you'll find yourself getting into some trouble at one point or another.

M: [inaudible]

Matthew Shevach: Oh, it's a tough question. I once got asked that same question by someone. The question was, are you a service provider? From a service provider point of view, in terms of providing access to the CGI BIN — the cost of the security risk, or maybe the risk of people using a processing time by giving them access to your CGI BIN versus having them write their CGI and then having to re-code the CGI for them — how would you balance that? I certainly think there is a risk in terms of allowing people to write their own CGI. They could be writing CGI scripts that just loop over and over and not know it — and you'll find out, I'm sure. I would stay away from it.

I think a nice middle ground may be to set forth some guidelines and maybe work with an integrator, or if you have someone on your own staff, to actually design some standard scripts. There's a lot of scripts out there on the Net right now and I'm often referring people to script libraries. If you can pull some of those together on your site for people to use, that could be a nice middle ground where they can put those together and then have access to loading those scripts and configuring those scripts. But for just free-form CGI, you may want to stay away from that.

M: [inaudible]

Patricia Sabosik: Well, the first is, what would we need to keep that? One is a larger base of PCs and modems that can handle higher speeds.

For example, the GNN Web site requires you to have Windows and a 486 or higher to get a good experience out of this, and also a modem of 14.4 or higher. And I think that with most Internet sites, as they become more complex, you're balancing an experience versus access. So to have a good experience you need that or higher, and 60% of the PCs in homes today are not that; so about 40% of the home users can have a good experience, but 60% can't. That needs to change, and I think the OEM bundling of both the access modems and CD-ROM drives installed in PCs will help to extend that technology base. But that absolutely needs to be in place before you can get a larger market share.

And also the technology needs to be easier to use than it has been up until now. Even today, if you have more than one on-line service, you have competing TCP/IP connections. You've got competing DLLs and one is going to knock out the other, because your system is just set up to use one — unless you can figure it to accept more than one, and that's not that easy to do. I have a few on my laptop and I know I always have to reset everything if I bring in another service. And I'm technically [proficient], but a lot of people are not, and it was not easy to learn. But anyway, you do what you have to do.

The average consumer, in order to make this a consumer market, doesn't want to know this stuff. That's why Apple is so great, because you don't need to know. You just plug it in and then things happen like magic, whereas in Windows — with Windows 95 things are getting easier, but they're not that easy yet. In a UNIX environment — well, a UNIX environment is not for the consumer market. So those are some of the things that absolutely need to happen.

In terms of testing and pricing, that will go on and it will go on at a grander scale than it's going on now until we can get some market shake-out. As to what will be a realistic price, the connectivity for Internet access is probably driving towards a dollar an hour. It's not there yet, but it's about to be. It was about three dollars six to seven months ago on average, so we dropped almost a dollar in a little less than a year. You may have another year to go before that shakes down, until [you have] market acceptance of this technology at a price that the market feels comfortable with — and two or three dollars an hour an average consumer doesn't feel comfortable with. So, those are some of the things.

Tristan Louis: In my view there is not going to be any stability in this market, at least not in the foreseeable future. As you may all know, the Internet requires a certain level of education, and as it was pointed out, unless you've got [sufficient enough] capabilities to get on the Internet you're not going to enjoy that experience. Furthermore, what is missing is a real standard on the Internet. We have standards committees, but more and more you have companies like Netscape and Microsoft coming out with proprietary extensions which are only supported by their own browsers. That has created a certain amount of instability in the market and it looks like things are going to get worse as times goes on.

Matthew Shevach: Just to add on, in my point of view I agree with Tristan in the sense that we most likely will not have one party controlling the Net. Even Netscape themselves, in their awe-inspiring massiveness today, probably will not be able to control and set standards, because we've seen that users are not as loyal to their products because it's very easy to get another product and it's very easy to distribute a new product.

Another thing I think a lot of people ignore when looking at Internet users is the lowest common denominator of Internet use, which is e-mail. The number of e-mail users and the standards for e-mail are a lot more established, and I think you're going to see — actually, I know you're going to see — some really interesting stuff in the next few months, stuff like free accounts and free e-mail access to the Internet. There's two companies, one called Freemark and one called Juno, that will be offering advertiser-supported products that will let you get free access to the Internet and e-mail accounts. Whether or not this will yield further on down the line to full Web access is yet to be seen, but that will add some stability on the lower end. E-mail is a productivity enhancer and a communication tool, and will probably become something that's much more intrinsic very, very quickly.

M: [inaudible]

Matthew Shevach: Freemark Communications, and I think they're... Juno's in Manhattan, an offspring of an investment operation. Freemark is partially owned by a company called CMG Information Systems. Freemark, I know, is very close to beta testing, and have been participating in that. They're a few weeks out, I believe. I'm not quite sure where Juno stands, but certainly by early '96 we'll see those rolling out. The model, once again, is advertising within the support of the actual application to give you free access.

Patricia Sabosik: Yes. That Freemark feature will also tailor the advertising to the kind of information you want. So if you're a skier, they'll sell Rossignol and other ads that will match you, so that whatever you query on you'll get the ads that you're interested in. They're trying to match personal profiles with information.

Matthew Shevach: Well, I think at the low end of the market it's going to bring some people in that may not have come into this market yet. In terms of their acceptance towards advertising, I think it will be taken pretty well because I think the market we're talking about are the people that would tend to watch TV more in terms of the displacement factor. Because if you look at it, people who use the Internet a lot tend to not watch a lot of TV. The people who are out there, who don't use the Net and maybe don't have the technological know-how or the incentive to go out and do something that may require a little effort, would be the market that this would attract. And it will be very easy to set up; it will be a one-shot deal in terms of the access and the application because it won't be all the bundles and features added in FTP, Telnet, Web — it'll just be e-mail. So it may be stability on the low end, but I do think it will add some confusion to the mix and it's going to obviously mix up the pricing model for a lot of other people.

M: [inaudible]

Tristan Louis: The question is, regarding the instability of HTML standardization, what do content providers do to deal with it? It's a difficult question. There is no doubt you could go in and use all those proprietary extensions, and yes, they would make your life a heck of a lot easier. Netscape has been pushing their extensions a whole lot, and what we have done at iWORLD is that we've decided to only include Netscape extensions that are supported by at least two or more browsers.

Now, the browsers we've chosen we're also not taking out of the woods. One of them is in *CSA Mosaic*, which is always supporting the standard HTML. They're sticking to the basics. The other one is the American Online browser — not the GNN browser, [which is a] very different thing. And the reason we've taken the America Online browser is that it seems to be the lowest common denominator, and this is one to deal with.

Patricia Sabosik: That's our browser group. Booklink Technologies was bought by AOL to give the AOL users a Web browser. So we built that into the client [server], but the browser was fairly powerful, so we stripped it down in order to work in the AOL environment, and it does give you a Web experience and it is integrated with the AOL client. So it's essentially a Web client imbedded in the X.25 AOL propriety client.

The GNN side of the fence is much more powerful: OLE compatible, drag-and-drops, split windowpanes, multi-tasking, multi-threaded, and we do the same thing in terms of incorporating Netscape extensions. There are very few that we incorporate; we do some, but not all of them.

Matthew Shevach: I think another answer to the question is this: not only will people have browsers that don't support Netscape extensions, but people will have older versions of browsers, even older versions of Netscape browsers. So one of the things you can do — there's some neat little get-arounds you can use to support Netscape extensions while still making it look pretty good for the other people. If you assume the majority of people are going to have the best browser, say, with a table, you could also include coding for people who didn't have tables, so that it comes out on the page not all wrapped around each other, and looks nice. That's one of the things we look at a lot.

M: [inaudible]

Tristan Louis: Okay. The question is, essentially, would this customization of pages mean a smaller load on all machines? It's a good idea, and I'm personally all for it. It's not an easy thing to implement, but it's an added service to all customers and all visitors. However, it can put a tremendous load on your machine. There are tools coming out right now — you're seeing them come out of the woodwork, bit by bit — that will allow you to simplify that process. I think as the Web grows and as more and more people get on-line we will see more and more sites pop up with customized Home Pages.

Patricia Sabosik: Can I just answer that? Another rule of thumb is that that kind of customization, with today's technology, can add half-again as much overhead to your server environment in order to meet that demand.

M: [inaudible]

Tristan Louis: The question is, what are some of those tools and how much do they cost? NeXT, the company formed by Steve Jobs, has come out with *Web Objects*, which allows you to do customized Home Pages doing queries on databases and so on. I'm not sure of the pricing on it, but I know it runs into several thousands of dollars. It's not a cheap option right now; I won't fool you, it's definitely on the expensive side.

As more and more companies are going to come out with such tools, I think we're going to see a market that is going to get a lot more competitive. As a result prices will go down, much like in all the other markets such as Web-authoring tools and so on. I'm not familiar with *Interworld*, so I can't say whether it's in that category. *Web Objects* is not shipping just yet; right now there are a few privileged ones who have had a chance of seeing it, [but I have] no idea when it is shipping. They've been moving that deadline around all the time.

Matthew Shevach: Today I was out and saw Steve Jobs speak on the release for *Web Objects*, and from what I recall they're in alpha right now, they'll be in beta the last quarter of this year, and they'll be shipping in early '96. But as Tristan said, there are some sites that have been using the NeXT tools as a development partner. I think the Dodge site and I think FedEx might have used some of it as well.

Patricia Sabosik: The *WebCrawler* runs on an indexed platform as well. The market that we're headed for with the robust GNN browser is the personal Internet user. We're looking at someone who is technically advanced; we called them TAFYs, "Technically Advanced Families." It's consumer-oriented user in the home. So we're looking at business people who want Internet access at home rather than in the office and students who are graduating and want to keep that Internet fix. We're targeting the college market and the post-college market, and we're also targeting students in high schools and grammar schools that want Internet access and don't want to go through an on-line provider. So it's families, business people and students.

The SOHO market is one we're also looking at. SOHO, for those who weren't here before, is the "Small Office/Home Office" user, and we're absolutely looking at that market as an add-on. We have a small service now within GNN called Business Pages, which allows small users to advertise their products. We have standard forms where you can buy through us, and that will be beefed up. We also have some larger organizations that will be sponsoring some interactive areas just designed for small businesses as well.

M: [inaudible]

Tristan Louis: The question is, when you're adding all those tools such as chat, news threads or [inaudible] and so on, do we actually have a strategy? I could say no and make a lot of news, but I'm not going to. Yes, we do have a strategy.

It's become very clear by now that interactivity on the Web is essential. If you want users to come back to your site you have to make it interactive, and therefore you have to evaluate a bunch of products and be very careful as to what you're going to select. You want to make it as easy as possible for users to use. You also want to make it as cheap as possible for you to buy. There is a host of products that are available out there for free — yes, you don't have to pay for everything you put on your site. You can actually find a student somewhere out in the university who was probably bored one night and spent a lot of his time just coding a [inaudible] engine, and it happens to work.

For example, we re-launched our Web site and we're using HyperNews, which was developed by a couple of people at EIT. They give it away for free. We tested it out, we liked it, we made a couple of changes to it and now we're running it.

Then you have to look at other tools and think, well, maybe I have to buy this. It all depends on what level of interactivity you want to give your user, and I would recommend going with a high level of interactivity if you want your users to come back. And there's also how much you're willing to pay for it, and how easy you want those tools to be.

Patricia Sabosik: And time-to-market is important in this environment as well. So if you want all those features and you want them now, you may be buying them as post-components.

Matthew Shevach: I think, just to add a little bit on, that it's a double-edged sword, because if you are going to have time-to-market [as a consideration] you're going to be paying up front for something, but the chances are that down the road there's going to be something else. I think your strategy, although you need to have it, needs to be very flexible as to your long-term outlook — and in this business that [long-term outlook] is going to be very short, because there's going to be new products, new features.

And the other thing you're going to run up against is adding new tools on, tools that want to talk to each other but maybe don't. You're going to have some conflicts between tools, so you're going to have to be pretty careful in terms of evaluating things and there's going to be some pros and cons at each junction.

Tristan Louis: I actually want to add one thing. When we say "long-term outlook" on the Web, we are meaning probably nine months. I'd like to remind you that a year ago the big thing was *Mosaic*, that a year ago nobody had heard of such things as *Lycos* or *Yahoo*, or very few had heard of it. And now there's other big players on the market. So, in nine months, who knows who they will be.

M: [inaudible]

Tristan Louis: The question is regarding the maintenance issue of interactive content. Yes, it's a high cost of maintenance; I'm not going to fool you. We actually have a staff working full time and making sure that everything is running properly and everything is threading properly. And then you have programming issues, getting the right kinds of speakers in — it takes a lot of time. However, you'll find out that the time you put in is the time you'll get out. If you don't put any interactivity on your site, users are going to come in maybe twice and never come back. If you create a fairly interactive Web site, people are going to come back time and time again.

Don't forget: how do you pay for a Web site? Basically, right now, it seems to be advertising. How do you sell advertising? By selling to a number of people that came to your site. How do you get people to come to your site? By creating an interactive one. As far as management of interactive elements, no, there are no real tools. A lot of tools that are provided actually have the management suite built in. For example, in the case of the Net threads that we're running on our site for message boards, we actually have a [home] manager, front-end, that works on their X-Windows and allows us to manage our content that way.

Matthew Shevach: One more addition. I think one thing you really want to consider is possibly some good document management strategy or software in terms of looking at what pages are where, because when you get into a Web site that has 3,000, 4,000-plus pages it's going to start to get very confusing. Also, in terms of strategy and some guidelines: you're going to have a number of people working on this site, keeping copies on their hard drives at home, and you don't want to have people writing over things that other people are doing; so a document management strategy becomes very, very important.

M: [inaudible]

Patricia Sabosik: If it's Navisoft, as the division, then the authoring tool is NaviPress and your author to the server is NaviServer. It's not HTML-based, though there is an HTML converter inside the software. It's designed for users who are not sophisticated enough to be able to create their own Web pages, and to save them to a server where it creates HTML on the fly and is immediately up and available. So we're actually looking at a much less sophisticated market for that. We'll be using that particular feature in different parts of the GNN service. It's not in AOL yet, not because it's hard to use but because there are firewall and proxy issues, with writing to AOL servers. We've opened up one server within the GNN system to allow that type of interactivity. It still does sit behind a firewall.

That tool is designed for two markets: one is the Internet consumer market where they can create personal Home Pages, personal message boards and a certain amount of interactivity within certain sites; the second market is completely different and outside of the GNN service, and it's the small to medium-size businesses and the publishing business itself. It's a wonderful document management system in and of itself, and we do have some large corporate clients that have licensed that software to use internally as a document management and authoring tool. It can sit within your firewall and you can save it through an internal server. It's easy to change things on the fly and it also keeps track, as a lot of the authoring tools do, of links and the arrangement of links.

This one has the mini-Web feature. Interleaf's *Cyberleaf* has a tracking system that will check your links and also give you a map of what your site looks like. *WebSite*, which is software from O'Reilly, will also keep track of broken links. *AutoWeb*, a Mac-based platform, will do the same thing. So, that's sort of our strategy, those two particular market segments.

M: [inaudible]

Tristan Louis: The question is about how to price advertising for a Web site, and in this particular example it is medical publishing. I can only say one thing: low. Have very low expectations when it comes to advertising on the Web. Don't forget, there are over 100,000 sites on the Web and they're all going to want to pull in some advertising at one point or another. As a result, that makes a huge marketplace.

Prices right now on some of the most possible sites are just wild. They range from anywhere between a couple of thousand dollars to \$25,000 for one of the most expensive ones. If you go in and manage to get high enough traffic or deliver a specific audience to your advertisers, you can set up your advertising based on this.

But I would recommend that you start up low, get your advertising base in place and get all your positions filled, and once all your positions are filled let the marketplace dictate what your prices are going to be.

Patricia Sabosik: Medical publishing has traditionally had very high advertising rates in print. Why don't we take a look? Pfizer and Squibb and Merck have interactive sites on the Web today and they're doing internal advertising of their products. And if you're in that league, Merck is probably the most interactive of the large medical publishers. Also, the *New England Journal of Medicine* is advertising, so see what they're pricing. They have both the *Consumer Newsletter*, and bits of the *Journal* are in a Web site now and they're not that low. They're in the high thousands per week.

Tristan Louis: Once again, this is because those particular ones deliver a very specific audience. I mean, [let's say that] I'm Joe Surfer, and I'm not interested in medicine. I'm not going to go to the *New England Journal of Medicine* site or maybe I'll go there once, but I don't think I'll come back.

On the other hand there are more general sites. For example, take *Hot Wired*. *Hot Wired* appeals to a very general audience — it appeals to Net surfers. That's essentially how they define their audience. Yes, they're going to get a high head count, but say you're an advertiser that wants to sell tires. Would you rather advertise on a car site or on a site like *Hot Wired*? You're going to get a wider audience on *Hot Wired*, but it's not quite as specific. Therefore, you've got to look at what your advertising dollars are going to sell you. And when you're going to your advertisers, you're going to have to look at what kind of content you can give your advertisers.

In our case, on iWORLD we've actually decided to go after internal advertisers because we've decided to transform iWORLD into the primary source of InterAd information anywhere.

M: [inaudible]

Patricia Sabosik: These are two different things, the CPMs for print-based advertising compared with the CPM that you can get on an interactive Web site. Right now, there's a better cost/reader ratio in print than there is on the Web, but I think that will drop over time.

Matthew Shevach: I think also some of the larger sites, actually, InfoSeek and Lycos, their CPMs are actually much lower than the ones that were listed and their pricing is actually based on what they call an "impression." Of course, that's a very broad, general audience, so they would deem that a lower CPM. As you have a specialty audience, it may be higher.

The other thing that makes it very hard to compare is that you can actually measure things with the Web site that you couldn't measure in print. You can measure things on-line.

[You can say,] "Well, yes, they saw the ad in a magazine." One, you don't even know if they saw that page.

Two, on-line you can tell if they actually went a little deeper in and where they actually went. It sounds like in your case these advertisers don't have their own Web sites. That correct? Right. Yes, so we've been very lucky, obviously, in the sense that our advertisers are all

Internet product suppliers or Internet [inaudible] providers, so we don't have to worry about that.

So in terms of designing a product showcase for them, you may be able to sell them on the ability to provide information, sort of like a reader service card would in a magazine. And to them, I think there's a lot more value. So if you can price it cheaper and say there's more value, I think you may be able to sell them on that.

M: [inaudible]

Tristan Louis: The question is, how much experience do we have as to the accuracy of the data and the CPMs? That's a very interesting issue, because up until very recently there was no such thing as an audited Web site. When you get a magazine, you get an audited circulation. When you have the TV station, you get an audited number of people watching your show — the Nielsen Rating.

When you get a Web site, in a lot of cases you don't have any kind of audited data, so it's very easy to actually tell people, "Yeah, I'm getting a million hits." On the other hand, when you get an outside agency to confirm that, it may not be the case. Don't forget, a lot of people are selling advertising on hits. What is a hit? It's essentially one image or one page that has been loaded one time. Take a page that has 20 graphics on it; [if one person visits that site,] that's 20 hits. One person, one visit, twenty-one hits. It's very easy to drive your hit count up.

On the other hand, what you're seeing now is the big auditing firms from the outside world such as Nielsen, the BPA, the Auditing Bureau of Circulation, all teaming up with companies to audit Web sites. iWORLD is very proud to be one of the Web sites to test out a lot of those auditing systems. We've already announced that we were testing out the ABC and the BPA to audit our Web site, and we will be able to go to our advertisers and say, "Yes, look. We have an outside firm confirming that we have X number of hits." At that point I think that adds some value to our advertising, and I think that will confirm to advertisers that they want to go with us over another, unaudited Web site.

Patricia Sabosik: Are you doing any filtering with those hits or is it just an audit that the hits are legit?

Tristan Louis: Well, actually, what is happening in those cases is that the log files are not resident on our machine. We have log files resident on our machines, but we're also running a process that allows for the auditing firm to generate their own log file based on whoever comes in our site. So we never see the log files.

Patricia Sabosik: So are they filtering out by user?

Tristan Louis: Well, I can only speak for the Webtrack/ABC engine because that's the only one we've gotten up and running so far, but they are filtering by users and they can even tell us how long a user has spent on our site.

Matthew Shevach: There's some tricky questions concerning that. I mean, in terms of measuring users, a lot of people have looked at it and said, "Okay, if there's this many hits, there's this many graphics, let's divide by this number, and that's how many users you're going to get." That's very tricky.

One of the most common technologies people are using now is something called "Link Rewriting." You'll notice at a lot of the Web sites you're going to start dealing to that you see

this really funky code or insertion in your URL. What that's doing is that when you come in to that site, it's assigning you a code and then tracking you with that code based on the IP address or the session or the origin of where you came from.

It's going to be very hard, though, and I think that we're going to be sometime out from some standards even though ABC, BPA, and Nielsen are all getting into this. I think it'll be a while until we can agree what actually matters and then, when you tunnel down to it, to some things people aren't looking at yet. How many people came into your site, got this far and then just left through a link? That really doesn't mean anything. I don't really care if I'm an advertiser on a site and someone came in, didn't look at anything and just went to another site that they pointed to. So you're going to want to look at things such as rejection rates.

You're going to want to look at how many people spent a lot of time on one page, or actually went into an ad. You can tell if that's working at this point. But it's going to be awhile until advertisers have a way to just take a sheet like they do with a magazine and say, "Okay, this is it," compare it to this one and say, "Ooh, this one's better." That won't happen for some time.

M: [inaudible]

Patricia Sabosik: You might want to look at John Wiley. They were in some beta tests or considering some beta tests with the National Association of College Stores. Another organization is McGraw-Hill and their customized textbooks, and they were looking at an Internet delivery system. Right now it's paper-based, but they are doing some work, have some joint ventures with EduCom, and I know they were moving in that direction.

Also, check with the National Association of College Stores because they had a pilot project, at least in the conceptual stage about a year ago, called the Virtual Server where they would deliver electronic textbooks in a local environment and it would be course-packaged material. America Online also has an experiment going on with Simon & Schuster's College Division to deliver course materials into the classroom.

M: [inaudible]

Tristan Louis: The question is, essentially what is the value of advertising on-line if I understand it well, and what should we do to make advertising work? From our point of view we are hooking up to the Internet product, to Web sites talking about Internet products. Now, I can't go in and tell you that you should advertise your product in this way and you should design your ads this way in order to make them work; that's the work of the agency or the work of your advertising department. What I can do is say, "Okay, if you give me a banner that's good enough and you buy a position in this particular area that is of interest to your public, I can make sure that people will get into your site."

When you pick up a magazine, do you actually think, "well, I wonder how efficient this is?" When you watch a TV ad, do you think, "does this work?" When you listen to a radio ad, do you ask, "does this work?" That's a very big demand on us to ask us to essentially sell your products for you. We are not your marketing department, we're just an advertising medium. A new one, that's true; but at least we can tell you that we are guaranteeing you an audience and that this audience will get to your site. We can actually tell you how many people asked for more information by just clicking on that link.

Patricia Sabosik: I think that's a very good description of where we are today in advertising in the early stages of an interactive medium. But as we move forward there will be more clever

advertising models that will come on the Net that are much more interactive, that maybe in the advertiser's Web site. For example, AOL or GNN or some of the other large-volume Web sites will have ads within the site that the clicks stay within that site, and then those logs are reported separately. So there's a lot more interactivity between the content and the advertising.

There are some travel companies that we're working with to do that, and you'd get a lot more information as you drill deeper down into something that is advertiser-sponsored in the sense that it's bringing a different flavor of content into a site that's complementary with the material that's already there. In personal finance, for example, there are some investment services that are paying to have their content merged with some of ours to provide a particular point of view.

And you're absolutely right about a specific audience; there the value of that is based on how targeted that audience is as opposed to how many hits are coming through because the hits may be lower, but the response rate would be higher.

M: [inaudible]

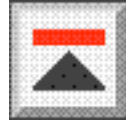
Matthew Shevach: I think it's a mix. Most of the big advertisers do have agencies or departments that are doing it. Some of the sites themselves, though, have taken steps to do different types of advertising. *Word Magazine* at www.word.com is one that comes to mind. Initially, when *Netscape 1.1* came out with the server-push/client-pull, it was actually flashing up ads when you moved from one section to the next. So you would be in a section, you would click on a button to go to another one, a whole screen would pop up with an advertiser's name on it. And then the advertiser would have a smaller position on the next page. I thought that was neat, but of course there's some limiting factors there for people on a 14.4 modem, and even that's going to add a lot of time going between pages and will really make them angry.

But I think you're going to see things like that starting to evolve, as Pat was saying. I think that burden will be obviously mixed between the site you're on and the agency or department within a company, because you're going to have to cooperate on how you're going to link up those technologies.

Tristan Louis: I'd like to add also that there's a lot of new tools coming out, the most prominent of which is Java, de-blocked by Sun Microsystems, which make an ad a lot more appealing. I'm sorry, but if I see an ad just rotating around my screen when the rest of the screen is very static, I'm going to click on it because I'm going to be intrigued by what's behind it and what else they have to offer.

That concludes this program. For more information about other recorded programs, please call Canyon Interactive at (818) 879-1151.

INTERNET PUBLISHING SHOULD PUBLISHERS JOIN THE PACK OR STAND ALONE IN CYBERSPACE?



MODERATOR

Bill Washburn

Senior Vice President, Internet Business Group, Mecklermedia

SPEAKER

James Outman

Vice President/General Manager, At-Home Division, Information Access Company

James Outman: I think we can get started. I want to, in a sense, apologize; I very slightly changed the thrust from the advertised title. I thought it might be a little presumptuous of me to try and answer the question that I originally raised, which is whether publishers should mount their own Web sites or pursue some other strategy in partnership with other players on the Internet; obviously the answer is that it is going to vary tremendously from one publication to another. I thought it might be a better use of our time this afternoon to suggest some of the questions and influences that publishers might want to be fairly clear about before they proceed to action.

One of the questions that I am curious about is why you are all here. I expect that some of you see an opportunity to take advantage of the Web or the Internet, and I expect some of you may also see at the same time a threat to your existing publishing activities.

Some people may think, "well, this an opportunity for a product line extension in publishing." I actually heard someone earlier say, "well, you need a presence on the Web." I really didn't hear the reason that he gave for that, but clearly there is a sense that, "everyone else is there, so shouldn't I be too?" I think all of us share this sort of conviction that, in fact, the Internet and/or the WorldWide Web is the next mass medium.

No question that the conference program overall shows that there are many aspects of the Internet that are interesting to people; partly as a technical phenomenon, there are a lot of questions of how to do it. I think it's a little less clear, but nevertheless true, that the Web is also an economic and social phenomenon.

So far tool suppliers like Netscape Communications or on-ramp providers have discovered successful economic models in selling those tools to people who would like to publish on the Web. Information publishers, I think, have been less successful so far in finding successful business models in using the Internet or the WorldWide Web, although they have found a fascinating, exciting, possibly profound social phenomenon in which even elementary schools have now become publishers on the Internet.

I think the best course of action — or several actions — for a publisher depends on how you view the Internet and its relationship to your existing business. Is it a product line extension for a print publication? It's a different manifestation of your print publication; it's an opportunity to extend your franchise into a new area — research, for example — or it's about extending your brand into a new medium. Maybe it's a unique new publishing opportunity... Or none of the above. Of course, these are not mutually exclusive; publishers don't have to necessarily choose one to the exclusion of the others. It strikes me that much of what publishers are doing today on the Internet is in the nature of an experiment in one aspect or another of digital publishing; and while I certainly agree that experimentation is necessary, in order to find the model for success I also think we can all save a good deal of time and money by thinking and talking about the likely elements of success or failure.

What's tremendously exciting in the 90's is seeing and participating in what we just heard described as an emerging new mass media — or is it a mass medium? Certainly the

Internet and the Web are emerging in some similar ways that television did 50 years ago; and I presume that most of the people attending Internet World are looking to take advantage of this new opportunity — not necessarily a business advantage — on the Web.

And like television and radio before that, the Net is attracting a fascinating combination of established players, older media and newcomers who see the very low cost of participating in the “next big thing.” The mix of participants is tremendous; there are people from the world of academic publishing alongside people from the world of computer gaming. Television networks are in the game, alongside magazine and newspaper publishers, individual contributors, authors, and of course advertisers.

Some view the Net as a possible renaissance for distressed distributors. I’m thinking here of libraries, for example, who are looking to regain patrons and extend their franchises and their information hub for the next generation, as well as segments of the media that are seen as hurting economically, such as newspapers with really unbelievable price increases for newsprint and declining circulations, especially among Generation X.

Eventually — and probably sooner than later — the winners in this new media will begin to emerge from the field and there will be an inevitable shake-out. Some plans will pan out, some will not; and those who have action without a plan will almost certainly be watching from the sidelines.

One way that I find useful in trying to understand the business opportunity afforded by the Web is to think of every media as being structured as a result of a push/pull tension between three entirely independent forces: technology, society and economics.

The fact that print and broadcast successfully coexist suggests to me that in fact the Web, if it’s to become a mass media, will take its place alongside the existing media, not in lieu of any one of them. And while I can’t speak to the long-term prospects for newspapers or magazines or even television, I doubt whether the Net will simply step in and replace any one of them. I’m not sure that we’re seeing a large migration from existing mass media onto the Web, wishful thinking notwithstanding. The reason is simply that the Internet is likely to emerge, if it does, as a unique resolution of the tension among these three forces. Obviously the Net is going to effect the existing media, but not in necessarily obvious ways.

For instance, who predicted that the impact of television on newspapers would be to push papers to publishing in the morning instead of the evening? And that influence wasn’t strongly felt for at least 25 years after the beginning of broadcast television networks in the 40’s. After all, we’re all basically competing for people’s time and money, neither one of which is increasing at anything like the rate of expansion of opportunities and [inaudible] on the Web.

The rise or fall of any particular publication, or even [any] media, will depend more on that media industry’s unique blend of these three factors: economic, social and technology.

Technology created the Web — the Internet, rather — and more specifically the WorldWide Web. And it’s technology that is pushing the network, just as it did in the case of printing, or with the invention of steam power [inaudible] presses in the 1830’s, or in the early years of this century with telephone, radio, film and later television.

But technology does not act in a vacuum. There are social forces, including government, and in general, people’s attitudes, desires and fears, that react with technology in order to define the nature of the medium. But consumers don’t like the technology, or they view it as a harbinger of something harmful or undesirable. They want to adopt it, and they might even insist that the government regulate it. There are plenty of people, especially in Washington D.C., who quite benignly view the Internet technology as a kind of public utility — rather like the improved highway system — and [believe] the government ought to fund it and control it. In fact, the Internet wouldn’t be what it is today if it weren’t for that view, and it’s still quite prevalent on the Net today. Look around at the contributors and you’ll see a large number who

insist that the Net should resist commercialization and continue to be free — which is mostly to say tax-supported. Many of these people seem to believe, I think somewhat naively, that government funding will come to the party without it's evil twin of government control.

And there are economic factors that tend to effect the development of mass media that are quite independent of either technology or social attitudes. Economics strongly influence how or even whether a given technology will turn itself into a business opportunity. The eventual nature of the Internet as a mass media will reflect the influence of all three of these factors interacting with one another. In short, never mind how cruel it is; if the economic and social forces are not in alignment, it won't happen.

Some people fear, and perhaps some of you believe, that you understand the Net. This is a good thing, because for me, in thinking about the Internet as a form of media, it seems to me at this stage that I see all three of these factors as very much in play. I see anecdotes about what seems to be successful and what people are doing as experiments, but I don't see any clear evidence of formulas for success.

So in my ignorance of the outcome I tend to be skeptical of people who talk about using the Web correctly. Whether they're talking the technical sense, the economical business sense or the social sense, I don't think anyone knows yet what's correct or successful in publishing on the Internet; although I suspect that that sort of claim is pretty good advertising for consultants. And after all we all came here for answers, not just for questions.

My own sense is that there is a good deal of experimentation going on, but on the part of publishers and on the part of advertisers. The social and economic aspects of the Web have not yet been heard from, even as the new technology races forward in some amazing and very cool directions, directions which could change the fundamental technological nature of the Internet.

Lets just talk about the technology for a second and try and understand how it might impact the development of the Web as a mass medium. In thinking about the key technical aspects of the Internet there are three things that I need to talk about; and I'm not going to mention the words HTML or Java.

The first is the leading crusade of our time: media convergence. Partly this means that everything is coming together in one place and you can technically more or less watch television over the Internet, or you can talk on the phone, or you could read a magazine. The conversion also means, especially for publishers, that traditional boundaries between different media have effectively disappeared. In the pre-digital world printed books or magazines didn't have moving pictures and video didn't present words to read. Video could not really present the kind of detailed information — I'm thinking of a chart in *PC Magazine*, comparing a variety of laptops, for example, — that magazines excel in. And on the other hand print really lacks some of the power of video to tell a story.

In the pre-network world a magazine publisher competed with other magazines in a particular market segment and only secondarily with, say, broadcast or newspapers. There was some overlap, but less and less over time. Magazines that didn't understand that don't exist anymore; although not in the original form, I'm thinking of *Life* magazine in the 50's, which thought it could compete with television. And *Life*, and this sort of broad-circulation magazine, eventually gave way to a publishing model epitomized by, say, Ziff Davis, which found some advertising-oriented and community-oriented communities that it could serve.

So over time the boundaries between different media became pretty clear, you knew whether you are a print publisher as opposed to a video producer.

On the Internet the technology now makes that less clear; and regardless of the level of competition the real competition was, and still is, for people's time and money. Still, we all understand the difference between a magazine and a TV program and a telephone conversation

with a friend. The content could be more or less the same — the war in the Balkans, or even the coolest development on the Network — but the context of that is to say a print publication or a television show or a telephone conversation was different. The information was presented quite differently, and the consumer's relationship to the media is quite different — more or less involved, more or less passive. These distinctions are not clear, and in fact the fascination of the Internet, and especially the Web, is the way technology allows a variety of presentations to be blended into single sites. And of course let's not be deceived into thinking that the technology is a done deal.

Everyone can see the possibilities of broad bandwidth into the home, to say nothing of developments like Java — even though I said I wouldn't mention that word. The speed with which broadband arrives on your desktop — thereby enabling video producers to really join print publishers on the network — is being determined today more by the social and economic factors than by technology, because we know that the technology is there, but the economical and social factors are not. At least not yet.

Conversions have some very practical impacts on a publisher. For example, a publisher or a producer from yesterday basically packaged creative content for an audience, and you had to take the package as presented. Today the technology enables your audience or some other producer to unbundle your package and create his or her own custom package. On a simple level, this means using filtering software or search engines and the like to assemble some unique packages of related information — say about news from multiple sources — all of which are now interconnected by the network.

Should publishers therefore think of publishing smaller packages, like individual articles instead of larger ones? There is clearly an opportunity on the Web, but one that may require some other integrator or aggregator in order to take full advantage of it.

The new Internet packages may combine print, video, sound, and graphics. As a publisher or producer, do you have the expertise to provide and combine these elements? Or should you let your customers or some other Web producer use your creative content in ways that you effectively can not? And of course your customers can also misuse your content in ways that you may not be able to control; but that's another question.

And by the way, there's clearly a major social question of whether the mass audience wants to rule their own. There's plenty of evidence that this interest is only a small group of upper-end consumers, which might indicate that the Web is, after all, not destined to become a mass medium.

Who's going to succeed in this world of convergence? Is the system of new media simply a conduit for all sorts of media producers and publishers lying down together like the lion and the lamb? Or is it just combining elements from the old media and cool Web sites? Or has the combination somehow bred some new species all together?

Maybe Web sites have [inaudible], instead of evolving from the dinosaurs of the printing press. I don't think we really know yet, and based on what we can see on the Web today some print publishers believe the Web is about making still photos move; some Web publishers think it's about the revival of the telephone party line, and some electronic publishers view it as a distribution mechanism or an [inaudible] to an existing medium, a way, for example, that a radio station can present program information, or have new electronic print data to their existing electronic data. Who's right? The technology won't tell us; it just raises the questions and offers the possibilities.

Connectivity is another cliché of our time, and is arguably what the Internet is all about. It is certainly something a publisher needs to think about, because it will have a big impact on the nature of your product, and it will have a major impact on both the social and economic aspects of the network.

Within a single medium like the telephone network, connectivity has always been critical. But the connectivity was between individual users, one-to-one communications. The Internet enables the other three forms of communication, one-to-many, many-to-one and many-to-many, and it allows individuals to take advantage of all three at very low cost. One of these forms, one-to-many, has long been the province of publishers and producers; now it's available to anyone for \$10 to \$20 a month. By enabling connectivity, the Net seems to demand connectivity.

In the case of the WorldWide Web, suddenly it's possible — and therefore critical — to connect your Web site with others. This is something publishers and producers never worried about before, and it's a capability that tends to blur the distinction between one publication or Web site and another. The Web seems to be just that, a seamless Web of pages or sites, no one of which has a beginning or an end. What implication does that have for a publisher who's used to a front cover and a back cover?

As you know, there's a whole industry of people creating sites that are mostly comprised of pointers to other sites. Internet consumers expect to be able to jump from one site to another related one, including — or perhaps most especially — to sites put up by your competitors, but by entirely unrelated publishers. This is a public service, but you as a publisher are expected to provide it because the Web enables it.

Interactivity is the third leg of our three-cliché technical platform here. Quite obviously the Net is not a one-way medium, like publishing or broadcasting; it's two-way. Readers and viewers want to talk back, don't they? Actually there's not much evidence that large numbers of consumers do want to talk back to their televisions, or even their books. Some do, and for them the Net is a great thing, because the technology enables it. But more people have made major profits from one-way media than from two-way.

On the other hand, people like to talk on the telephone; the number of long distance minutes sold by long distance carriers has almost doubled over the last decade. So it may be that people do want to talk to each other. What does this mean for publishers? Does it mean that your readers become your contributors? What does that imply for a publisher who traditionally had been the gatekeeper or "getter" of information?

Indeed, what is the role of a publisher when his or her readers are arriving without the benefit of editors? Indeed, for some services these conversations, which are searchable, are in fact a form of public publication in and of themselves.

Perhaps more importantly, is it necessary to use this technical capability just because it exists? This is clearly an area where social expectations will play a huge role. Successful magazine publishers in particular have long realized that they were the focal point for virtual communities of people with special interest. Now the Internet is challenging publishers with its greater capability for members, or great members of virtual communities, and enabling them to find each other and interact with each other — hence my allusion earlier to the telephone. Would you rather read a review of a new computer in a magazine, or talk to someone who owns one? If the answer is you'd rather talk to someone who owns one, what future does that imply for magazines in the computer era?

So I think publishers need to consider whether they'll still be able to be the focus of these communities, or whether they need to find a new relationship with the virtual communities that helped create it in the first place — but which today now exist on the Internet as newsgroups.

And this I think lies at the heart of the question of whether a publisher should try to stand alone on the Internet, or what we think is the role in the world of Internet Communities.

I think the Internet may be the most valuable thing on earth, created by man, that no one owns — not even the government. At least let me admit my ignorance as to who owns it; I

have some understanding that the components of the Net are indeed owned by someone, by corporations who bought the servers and the gear needed to hook into the Net, or by government and not-for-profit entities like universities who contributed vast quantities of hard disk storage and intellectual property at no incremental charge to users. And I know the Net is regulated by a voluntary groups of providers and users; but no one seems to own the thing, and that makes it quite different from traditional media.

In the case of broadcasting, clearly governments claim ownership of the spectrum. In the United States the spectrum was given to private interests by Herbert Hoover when he was Commerce Secretary in the 1920's, and today the so-called public spectrum is traded among private owners for millions of dollars. The telecommunications network is also privately-owned in this country, although more typically publicly-owned overseas, and with the connivance of the government. In this country the owner of the biggest telecommunications network traded control of the network for a government-sanctioned monopoly — of course I'm talking about AT&T — and until recently the concept was that of a common carrier. The phone company let anyone transmit anything over its network, in exchange for a monopoly; AT&T itself transmitted nothing. That model has changed profoundly, with consequences that I don't think we really understand. I expect the Internet will be the focus of much of this change, with the two big carriers, MCI and AT&T, now beginning to play a new role as information providers.

Emergence of both MCI and AT&T on the Internet as content providers is just the most recent — and perhaps the most dramatic — example of how society, here in the form of government regulators, can impact the technological and economical aspects of a medium. As actual perspective players in the new medium we need to keep an eye on how government regulation — or in these days, deregulation — will change the economic landscape.

The issue of ownership arises in a different way as well, in terms of intellectual property, as it takes on a whole new dimension on the network. In the old world you had to be wealthy — as in the case of the corporation — have access to the means of distribution, and then there were effective ways of controlling intellectual property. But in the case of the Net you don't have to be rich to distribute intellectual property, even if it's someone else's intellectual property. When your customer uses network technology to de-construct your package and create his own, who owns what, and what is the granularity of ownership?

As we know, the nature of mass media has been generally towards concentration. This is largely the result of economic forces that say successful publishers will move to gain as large an audience as possible for economic reasons, thereby creating economies of scale for themselves and the ability to crowd out smaller, less successful publishers. Advertisers, of course, have been active participants in this; they'd much rather buy one add in one magazine than have to buy multiple adds in multiple publications.

I realize, of course, there is still great competition between the television networks, whether you count just four, or whether you include the many cable networks as well; but regardless of how many TV networks you want to count, the market share of the top four dwarfs all the rest.

A similar concentration exists in the newspaper industry, where we generally see only one paper per city, where once there were many. Concentration is less pronounced in magazine or book publishing partly because there are many more independent market segments. But within segments — I'm thinking of, say, computer magazines, at least the segments that I'm acquainted with — the role the concentration generally holds.

But part of the reason for media concentration relates to the cost of production and distribution. It's enormously expensive to produce a film or a TV show or a new magazine. It's equally costly to distribute it, especially when you consider the cost of marketing. The gamble, for the most part, is that there will be a concentration of consumers who will make this

worthwhile and which can attract advertisers to help pay for it. Of course, there are exceptions; newspapers and magazines tend to proliferate much more than television networks, and books even more so. Books, of course, are the other tension, because they're not ad-supportive. I think the Net today, or the Web, certainly seems to be a bit like this. The cost to producing a Web page is within the reach of school kids. Does that mean that publishers will be competitively disadvantaged if it costs them much more to create quality sites on the Web? Or will the concentration of the market that characterizes media sooner or later take over the Web as well, as higher-cost, higher-quality pages attract all the users?

And finally, distribution. Distribution is probably the costliest aspect of traditional media; it is certainly the big barrier of entry, and it's the aspect of the Internet publishing that attracts so many entrants. In the traditional media, distributions help push along concentration, which in turn makes mass media very profitable. Successful distribution means many people are consuming a limited number of products and the rewards can be huge, whether the business motto is "advertising pays" or one in which "consumer pays," as in the case of movies and books. By the way, I think the issue of who pays, advertisers or consumers, has a huge impact on distribution. As I said earlier, advertisers generally pay for large numbers of viewers — or readers, at least — at the time they are going to buy their products.

This in turn creates a case where concentrating the audience in a small number of outlets is a clear advantage for the advertiser. Consumers, on the other hand, have many diverse interests, and if they're paying they will support a diverse number of publishers. This is reflective in book publishing, which offers a huge number of new titles each year, many of which sell really relatively very few copies. And still there are book publishers who can make an adequate living on small volumes, and the distribution channels generally supports this.

The economic of "consumer pays" media have other characteristics as well, such as the "blockbuster" model that sustains Hollywood and, to a more limited degree, book publishing; the blockbuster model being, of course, that your profits really depend on the one or two big hits, having spread a large number of potential movies out on the market. How is that model going to apply to the Internet?

How does the Web effect distribution? I think the first question is whether the Web will emerge primarily as advertising-supported or consumer-supported. It could emerge as both, but then we'll actually have two different mediums perhaps using the same technology.

And I think if you're a publisher it's useful to understand which of those models you want to go for. Of course right now no one is paying, by and large, which will become a problem sooner than later.

If advertising support does become dominant there will be a tendency towards concentration on the most popular sites. Some publishers — I'm thinking here of *Time*, in the case of *Pathfinder* — have already concentrated a great deal of content into a site that attracts very many hits on a given day.

But the Internet has thrown the advertising-oriented publisher a curve ball, because it turns out that advertisers can distribute their information themselves — recognizing that advertising had always been the combination of entertainment and information. The Internet advertisers need the packaging. Does [it need] distribution offered by publishers in the print and the broadcast world? Possibly not. On the other hand, can advertisers continue to attract consumers to their sites without the content offered by publishers? We really don't know yet.

The Internet also has some curve balls for the "consumers pay" model. If it succeeds, the Internet will continue to support a wide variety of small enterprises; but we still await a clear winner in the technology to find a way of conducting secure transactions over the Internet, so the consumers can pay per site and feel confident and comfortable in doing so.

I think that as a publisher this is the key question: who is going to pay? It's not yet been answered definitively in the case of the Web, but the outcome will certainly determine whether the Internet is a business opportunity for you, and just what size and sort of opportunity it becomes.

So the network changes all the assumptions that the media businesses base their business on. Production costs are low or high, distribution is cheap or expensive. Maybe the Internet won't be a media business model at all; as a medium, perhaps it's really a successor to the telephone network, allowing millions of individuals to become publishers with very small audiences, possibly as small as one. Although I think this is an unlikely outcome, I think it's a possible outcome in a media that may end up with a variety of outcomes.

Finally, society is a factor in determining the nature of a mass media. In some respects the social aspects of the Web may prove to be the most important of all. Certainly they're the most difficult to predict, and they're the most difficult to influence for any one publisher or vendor.

I think, to some extent at this conference, that there's an unspoken assumption that "if we build it, they will come." The assumption is that we will be able to cross that chasm; but there's a whole graveyard of technologies out there that never actually did cross that barrier, that looked very promising at the up-slope of the bell curve and then fell into the gap between "early-adopter" and "early-majority."

Let me just review three points here. First, government regulation. The government effectively created the Internet, funded it, and then dropped out. Is it going to last? I wouldn't count on it. By the way, this issue is not as clear-cut as you might think. I'm willing to trade my libertarian credentials with anyone, and certainly I have no interest in seeing Senator Exon, to cite one, regulating the content of the Web. If having pornography available on the Internet is the price we pay for freedom to have anything else we want, then so be it; you don't have to download those pages, and there are ways to protect young users. After all, we apparently solved that problem of protecting young users when it comes to the convenience store market, in their particular selection of periodicals literature.

But on the other hand, how do we feel about having, say, AT&T control the Net, now that AT&T is — at least in one of its manifestations — an information provider? Arguably there have been advantages in government regulation of the telephone network, and for that matter its publicly funded programming on PBS, which has more often than not broken through the mass market programming tastes of privately-owned television networks.

Secondly, market psychology. The very promise of the Internet is a cornucopia of information and material unfettered by some of the regulatory and economic constraints of existing media. Nevertheless, the public is not swarming onto the Net in the way, for example, that the public swarmed onto VCRs. Indeed, the mass audience has never swarmed onto narrow-interest publications. There's a reason that mass media is the way it is. Most people like what's on the mass media; you know, QED. So although the impediments of getting on to the Net are significant, as a consumer it takes a \$2,000 receiver, which in turn requires traveling up a moderately steep running curve. But I think this explanation for the lack of mass market consumers on the Net today consistently demonstrates the public's appetite for mass consumption.

The most vexing question about the Net is whether it's destined to remain a domain of a relatively small intellectual elite, or whether it will indeed become a mass media that will support advertising and major funding. Time will tell, but it hasn't told yet.

The other side of this question, of course, is the rate of adoption; or to put it another way, how long should we wait to answer the previous question? The personal computer is about 20 years old, and about one-third of households have bought one. Television, on the

other hand, over its first 20 years, gained enormous penetration — much, much higher over the same period of time. So does that suggest the Web may not be a mass media after all? And if it isn't, how should publishers relate to it? Put it another way; if you published a magazine, or a newspaper or newsletter, how many of your subscribers are now on the Net? When are they likely to get on to the Net? I don't think that any successful publication, whether they be broadcast or print, could possibly afford to drop their print or their broadcasting issues today and exist solely on the people who are on the Internet.

So, getting back to the advertised title [for this session]... I think some of the questions that publishers need to ask themselves about going onto the Web, as they rush to do so in very large numbers, is whether they have an economic model that fits with the technology model of the Web. Does your economic model allow for interactive users who may de-construct your products in order to create their own? What about the social model? Who's to be the economic and technical model? Will there be a lot of people who are willing to adopt Web technology? Will your readers or your viewers be among them?

What's your expectation of the eventual model? Is interactivity going to be important to people, or is it only important to a small number of people who are already there?

And finally, what's your tolerance of risk? This involves the risk not only that no one might come to your site, but that also you might spend considerable time and money only to fail in this new media. Actually, of course, my personal hope is that all publishers put up free sites as soon as possible and develop a very large tolerance to investing without return; I personally love surfing, and I think free stuff is absolutely great.

Finally, a very brief ad for Information Access, which is the company that paid my way here. We have put up a site, my skepticism notwithstanding, that's called *cognito.com*. It's a research service aimed at students; we see it as a downstream application of content that works, because there's so much content concentrated in one place on *cognito.com* — several hundred magazines and several dozen reference books. We're quite eager for publishers to join us as publishing partners in the venture, and I'd be delighted to talk to anyone who is interested in doing so afterwards.

Thank you for your attention and your patience.

INTERNET LEGAL THE LAW OF CYBERSPACE: AN OVERVIEW



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Wayne Martino: Just to make sure everybody knows, you are at the legal seminar, "The Law of Cyberspace: An Overview." Let's start with just some administrative matters. There are some handout materials that are just about gone that were in the front, to the extent that you wanted to get them. I understand that all of the sessions are going to be put on CD-ROM and may even be put up on the Web, so those materials may also be there.

The sessions we have scheduled for you today are threefold. In the morning there is an overview session where we will be covering privacy and pornography. Everybody can go back, you've now missed the handouts, they're all gone. We'll be doing privacy and pornography first, and that will be done by Lance Rose, who will be doing computer crime. We'll have a ten minute break and then we're going to come back and do copyright and trademark, First Amendment in advertising and then an on-line lawyer from AT&T is going to be here also. The last thing that they are reminding me of is there will also be audio cassettes available for you.

Just to get a flavor for who is here — how many lawyers are present here? How many people have practice in the Internet or are they just thinking about it? Okay, about the same. In preparing for this, I came across this cartoon which I think is particularly appropriate, and it's interesting for a lot of different reasons.

You have a fortune teller here who is telling the fortune, and I think that it raises some very interesting questions, the first one being "who is the fortune teller?" Is it the lawyer? Is it a lawyer who now wants to know about this new medium because they have been presented with an issue by a client? Is it a judge who now has been faced with a question and doesn't know anything about the medium, and now has to determine how he's going to deal with it? Is it a long-time, on-line user that says "The law of cyberspace? There is no law. This is the wild, wild west, we don't need law here." Or is it an academic who now is writing about this? And the worst thing of all is a legislator who probably doesn't even know what a laptop is, let alone the Internet.

You then come to "who wants to know, and why?" The person sitting across [from me], you can obviously tell, was very nervous. Why did they want to know? Well, it could be the same people who supposedly were the fortune tellers. The lawyer may be nervous and be going to somebody else to get the answers. The on-line user may be

going to a lawyer. All the same people who could have been the fortune teller could also be the person who wants the information... and why do they want to know?

Well, they want to know for a lot of different reasons. Maybe there is some additional factor that has now come into this, for example; there's a new user that's here, or someone from the investment community who is now going to invest and they say, "Well, I want to know what the rules are that are going to govern my behavior."

So, you could tell that this person was nervous. Why was he nervous, and should he be? If it was a lawyer or a judge or a legislator, they may be nervous because they don't understand the technology or the medium. They hear about the Internet, they see it in the newspaper, but they don't understand what this phenomenon is and they're not sure how to deal with it. It could also be that they are uninformed about the law. They're technologically savvy, but they don't know anything about the law and they're now interested in doing that. It could also be that they know that there are many questions in this medium but there's probably as many questions as there are answers.

So the question then becomes, why do we need the laws? I think what is happening right now in the industry is that the Internet is growing up. Right now it's in its embryonic stage and it's growing up, and what is fueling it right now is commercial activity. That commercial activity has a culture that says we want to know what the rules of the road are so we can govern our behavior. There must be predictable results to the extent that we put things on-line or our people are on-line, in terms of how we're going to approach this. There must be consistency of results. There shouldn't be a situation where in one circumstance the answer is one way and in another circumstance it is different. And this is all sort of being generated because of this commercial development.

The next question is, how are the laws going to be formulated? What happens here that I think is important is that people have to understand the custom and the culture and the context and the capabilities of the Internet. If you don't understand that, because this is a new medium, it is difficult to formulate laws or to apply principles that are going to make sense.

What you need to do is, after you've understood that, you have to look at existing legal paradigms to understand what things may be similar. That doesn't mean that something that may be similar is the end of the analysis, but traditionally the way that the law has grown up is that when it deals with new technologies it will look to see what things are similar and then apply those principles, or may apply those principles. Just because something may be similar or seemingly similar doesn't really end the analysis if you don't understand the rationale and the objectives and the evolution of how that law was developed.

Again, it is very difficult to understand and apply that to this context. Once you've made that analysis to determine if the existing laws apply or whether you should create new laws many on-line users — not many, but some — on-line users would suggest that there shouldn't be laws or that there should be totally new laws. I think that the way the law will develop in this area is not to throw out all of the old laws; it will evolve over time, and the common law will develop in a way that will make this all make sense.

As you look in the area to determine what the law is, which is why everybody is here, you will note that it is very much in its embryonic stage. It is probably much farther behind the development of the Internet as an industry from a legal perspective. There are a very limited number of cases and statutes out there. Probably, the fact that there are few statutes is a good result as opposed to a bad result. The record you'll see

for people is very — for legislators and all of the actors in this area — is quite mixed. In the legislators you have, for example, the Exon Amendment, which I'm sure Lance Rose will talk about, that has the potential in some circumstances to really inhibit the growth of the Internet. With respect to the courts, you have courts that are coming out on very [different] sides on the same issue.

For example, one recent case that has come up is the Stratton-Oakmont case [which] dealt with the liability of a system operator for content that was posted on its system. That case has recently been withdrawn. We don't know where the opinion is going to go but the decision there seems to be — besides, again having the potential to limit the growth of the Internet in terms of how it can develop — it also is directly contrary to another decision in the *Cubby vs. CompuServe* case. What you are going to learn today is that there are many questions out there and that there are some answers; but what's happening is that the law is developing in the area and it's developing in a way that will hopefully make some sense and provide some rules for everyone.

What is important here for people who are active in the industry is that you have to have the goal that is going to promote and not inhibit the growth and utilization of this industry. The industry is growing very, very quickly. There are tremendous pressures on it from legislators who are sometimes having a knee-jerk reaction to what is going on.

I think the article in *Time* this summer was a good example of that. When they had the Oklahoma bombing, all of a sudden there was a lot of interest in the fact that you could pull this material about how to make a bomb right off the Internet. What people failed to realize, or many people failed to realize is those materials are available in your public library, but because it is the Internet and the media has really become attracted to it, it is now going to a position where every time there is a case that we see in every day life but it has the Internet attached to it, some actor in the legislative role feels that they've got to propose a bill or some other mechanism to deal with the problem. I don't think that's the way the law is going to develop. It is probably more likely to develop through the common law which will be an evolutionary process and will be a process that will allow for people to understand the medium.

For those people who are long time users I think that one critical element is that they have to be vigilant in making sure that is what's done here with respect to the Internet does not destroy it. I mean, the potential for laws in the Internet again have the potential to both promote or to inhibit the growth and if the long time on-line users, or even the new users, don't communicate to legislators or courts or even the lawyers who are representing them what the Net is and what it means, the potential is there that it will be destroyed.

I'm going to turn this over to Lance Rose. Lance Rose is a partner in Lewis & Roca in Phoenix. He is the co-chair of the intellectual property department. Lance is a long time on-line user and prolific writer in this area. His book, *Net Law*, which is published by Osborn/McGraw-Hill and which is available upstairs, is a terrific overview of the law and I highly recommend it. So I'll turn it over to our first fortune teller, Lance Rose.

Lance Rose: Thank you. Privacy and pornography are a pretty big chunk to bite off and we don't really have time to get into how the whole thing works, but I was thinking about how to talk about this meaningfully and give a sense of stuff that is happening now, and also a sense of a little bit of the history. And there are a couple of recent events. It occurred to me there's a couple of recent events that many or most of you may have

heard of, that actually bring up both privacy and pornography angles, interestingly enough, which I hadn't even suspected. Wayne gave me a topic, privacy and pornography. Next thing I know, it looked like they come up a lot together, so it will make a nice kind of structure for the presentation.

The first thing I'd like to talk about is Operation Starburst. Anybody hear of Operation Starburst? Innocent Images, does that ring a bell? Okay. Anybody hear about the arrests of a lot of people who were allegedly trafficking in child pornography, many of whom were America Online users? Yeah, we heard of it that way. America Online, I think, is the key word there. This is a very bad PR event for America Online and I think maybe they felt a little bit betrayed about cooperating with law enforcement in that particular instance. I don't know the full story on that.

Anyway, it seems for a couple of years the FBI has been investigating so-called child pornography. trafficking in various kinds of on-line environments; and, by the way, who here has gone into the Internet other than through the WorldWide Web? Great, this is much better than the last crowd I talked to. Everybody was only a Web user. It was pretty incredible. So, apparently — I just get this from the news and stuff — apparently they were investigating for a couple of years, and eventually they went in a one-day kind of shot and went after a lot of people, and the FBI put out a public statement that a lot of these people were America Online users. They made a point of saying that; and they were very interesting events.

This thing has a pornography angle and a privacy angle, so what's the pornography angle? The pornography angle is this whole pornography and child pornography and this raid on so-called child pornographers, and apparently there were sting operations going on. The FBI had people out there posing as people offering this stuff to others, as people who were looking around for it — stuff like that — and luring all kinds of people in, according to what would supposedly be their own proclivities, into these relationships that would lead to their being under suspicion.

Child protection on-line is actually a somewhat broader subject. I mean, there is pornography but there is also this child protection thing which I'm sure we all see every day in the news at this point. It is a very big deal. Child pornography is just part of it. We have other major things that have been in the news.

As Wayne mentioned, there is the Exon Amendment or the Communications Decency Act which was one of a number of on-line, adult material-type regulations that were recently voted into law by Congress; although we're not certain yet what form. There was a cyberporn... *Time* magazine had a cyberporn cover story by a fellow named Marty Rim which was largely discredited. Much of the credit for the discrediting goes to Mike Godwin who is a regular writer for *Internet World*, which is a magazine associated with this conference, I guess.

There is software out there. There are people looking to make a fortune in software that will let parents keep their kids from getting at on-line pornography or indecent material such as *Surf Watch* and there's others — *Cyberpatrol*? Is that one? These great names. There is discussion about new laws against on-line pedophilia. As many of you might know, a lot of the universities are shutting down access by students to sex-oriented news groups, that's been going on for a couple of years. One particularly interesting one I like from the child pornography — I don't like it, I just find it of interest, I like it in that sense — is this proposal by Orin Hatch to extend the child pornography laws, which is really kind of neat in concept because it shows you how screwy legislators can get.

Right now we have a structure of three general kinds of pornography laws. We have obscenity laws, which is the really hard core, triple-X stuff; and that's the one where local community standards come into play. If the local community thinks it's bad news and it also happens to lack any serious literary, artistic or scientific merit, it can be obscene if the state law says it's obscene.

Then we have indecency which largely applies in TV and radio so far. That's like the seven dirty words that you can't say... and phone sex services being limited to getting only so racy before they are considered to be breaking the law.

Then we have child pornography and child pornography is not content-oriented, specifically. The obscenity and decency laws are content-oriented. If it is really bad news it can be obscene. If it's kind of bad news and you just want to keep kids from it but adults still have a First Amendment right to get at it, that's how the law works there. Again, based on content, it can be considered indecent. Child pornography goes at the production of the images.

There is this theory that the law is based on that any involvement of children in sexually-oriented materials likely involves abuse of those children, sexual abuse of some form. It is kind of a prophylactic law, so to speak. It's such a bad thing to have this potential abuse of children that you just have this very strong law outlawing any use of kids in the production of these materials, and there was a record keeping requirement making sure that people kept track of the ages and so forth. Well, Senator Hatch and some others have this new theory which is that sexual images involving images of children are tools that can be used by pedophiles and other people who want to lure children into bad sexual things; so now we should have a law outlawing any use or propagation of these tools, these images that can be used as tools.

This is a very strange theory. If you have a picture — it could be a picture of, you know, teenage kids with awakening sexual impulses or something — I suppose it might be used for sex education. If the wrong person gets their hands on it and can use it potentially to seduce a kid saying, look, it's okay. This kid does it, whatever it is, so you can do it too.

Based in this kind of theory — that it's a tool that's really awful — this proposal that's being made that child pornography laws outlaw the creation of such images, so it would no longer be just images involving the use of children in production, but something that might just come full-blown out of someone's head. Some artist could just draw a picture and then, based on the content of that picture — a sexual image involving a child — it would be outlawed. And apparently he says the precipitating event was the fact that you can easily, digitally — using things like *Adobe PhotoShop*, sticking a picture of a kid's head on a picture of, like, people having sex or stuff so you can make it look like the kid is having sex, and they don't like that. It's like another evil of the digital world. It's a very screwy theory. It's really way outside the First Amendment, but there's a proposed bill out there right now. So, there's this kind of weirdness surrounding pornography and on-line computer stuff. And Operation Starburst — I believe that's the name that was given to this child-porn-trafficking thing — is one outcome.

The interesting thing to me here, is that this isn't just something that went on for a couple of years and when it naturally came to fruition the FBI went out and arrested a bunch of people. It so happens that as Operation Starburst, as these arrests were made, as this public statement went out, there were about four or five — as I mentioned briefly before — four or five different on-line porn bills that Congress somehow magically all voted into law, one House or the other, which all have to be reconciled because they partially contradict each other. But we don't have time. Maybe if we have a

question-and-answer here, well, I can't go into all these different bills; but some are lenient on system operators, some are hard on system operators in terms of making them the cops for on-line pornography.

And while Congress — and they're still in the process of doing this — was preparing to figure out how to reconcile all these bills which could lead to a more harsh or a less harsh kind of regulation of on-line pornography, there was the announcement that there are zillions of child pornographers and you find them on America Online. This is sure to influence the thinking on how harsh the law should be. That's, in my mind, not a coincidence at all. I think it is, in fact, exquisite timing.

But there is another point to this. This is the privacy angle which really, I don't know how it affected others but it really took me by surprise. One or two weeks after Operation Starburst and the big PR event from the FBI, the director of the FBI went to some security conference in Washington and gave a talk on how the government really should be making it so that any of us who want to use encryption will have to give a means of decoding our messages to the government or [to] some government-approved agency; so that if agents want to take a look at what we're talking about — and upon proper process, whatever that is in a given case — they could get the keys and look at what we're talking about, assuming they could find where it is. So, this is interesting. So, I'll use this to very briefly do a little historical thing, very brief.

Encryption is self-help privacy. It is a way of securing your privacy without depending on anybody's laws, without depending on anybody to play nice. When you really want privacy, encryption is the way to do it, assuming it is legally available, which it is to you today. Governments, the U.S. government certainly — and they're not shy about saying this — they fear the use of encryption by terrorists and other people like criminals, people who would use the ability to hide what they're talking about to do bad things. This is certainly not an outlandish fear. A lot of people think it's an overblown fear in terms of the kinds of laws that get proposed to regulate encryption, but that's kind of the stance they take.

So, as I said, there is this key escrow proposal which the FBI is now openly pushing, they were kind of privately talking about it for a couple of years, as was recently revealed when a privacy group in Washington, under a Freedom-of-Information request, showed that the government was talking about this several years before they actually admitted they were thinking about it. But now they're openly saying that if people want to use encryption technologies and so forth in this country, perhaps we should have a law that says it can be secret from everybody but the government.

By the way, I saw in an article the other day that the European — what do they call it now, the European Union, European Economic Community? They keep changing the name, but it's a bunch of countries in Europe that are kind of acting together — and these countries led by France and Germany are considering having the same kind of thing, a key escrow in a large chunk of Europe. So this is an international kind of agenda. It's not just the United States crunching down locally to people who like encryption being the bad guy. A lot of countries share similar fears about the abuse of encryption.

So this guy gave this talk, and then to show the need for this ability to crack the code, he mentioned that several images found during this child pornography raid were encrypted. This was Exhibit A in his speech. I was reading an account of this and somebody, apparently he was there, said that someone in the audience asked the FBI director, "Well if the stuff was encrypted, how did you know it was child pornography?" to which he demurred. But you're not supposed to ask those questions. You're only supposed to take the conversation to level one and stop there. Thus, what originally

seemed a well-timed child porn arrest operation had another twist. It's also being touted as one of the reasons we shouldn't have self-help privacy in this country. So it's kind of an interesting connection there.

Okay, that was event one. The other event is a case that was recently started up. It's in its beginning stages, called "Guests vs. Lice," which doesn't really reveal who the parties are. It is a lawsuit by a bunch of users of a Cincinnati direct-dial bulletin board system against the State of Ohio and the Sheriff's Office of Ohio. In the summer of this year, I believe it was either spring or summer, a number of bulletin boards were raided including a fairly large one that apparently had several thousand users raided by Ohio state authorities in search of some pornography.

Raided, the computer equipment was taken back to the office. This is the standard style of investigating bulletin boards. They investigate for a while secretly; then, when they decide they've seen enough, they just grab the thing and take it back to the office. This has been going on, actually, for years. It never got much publicity because bulletin boards have always been such a grass-roots phenomenon, not highly recognized by the normal media. Bulletin boards, for instance, are as big a communications environment as the Internet or large on-line systems. They're on a comparable scale, but they just really never got the press because that's not what they were about — getting mainstream press. They are showing up on the Internet now, the more ambitious ones, and that's going to be an ongoing process. But some of their experiences are very relevant to what the rest of us will be going through. Web publishers and Web sites with increasing functionality that start getting towards being more like bulletin boards — with people interacting instead of just publishing at people — are going to have very much the same look as a local direct-dial bulletin board has today, except, of course, they'll be accessible from around the world.

So there was this system seizure, and there was a civil rights lawyer in the area who found this kind of disturbing, that all these thousands of users... This wasn't a bulletin board — this large bulletin board that was like a porn bulletin board — it was a bulletin board that may have had some pornographic stuff on it and it had thousands of people doing other things altogether, the perfectly innocent things that we know that people do on-line. It struck some civil rights. I don't know the fellow's name unfortunately, but it struck a civil rights attorney out there kind of odd that all these people would have their rights just trampled on in a search for a little bit of pornography. So he filed a class action against the Sheriff's Office on behalf of all the users of the system whose e-mail was taken, whose group activities were disturbed.

So what's the pornography angle here? I mean, obviously it's a State Sheriff's Office going after some pornographic materials on-line. The way they did it is fairly typical of state actions across the country. There have been some kind of notable ones.

I'm kind of curious. Has anybody here ever heard of Tony Davis in Oklahoma City having been arrested and sentenced to jail? Anybody? This stuff doesn't get all that much press. This guy ran a fairly large bulletin board in Oklahoma City and he also sold some CDs and he had a full stock of CDs, a full line of CDs, and a few of them were sexual or adult material CDs. Some of these CDs were also mounted on the bulletin board so that people could call in and download images, and the local police did an investigation. [A policeman] did a couple of buys of CDs.

When they decided they had enough evidence they went in with a TV camera. Out there in Oklahoma City, apparently they do those reality TV shows, I guess the national ones are like *Cops*, so they did one there, I think it's called *You're Busted*. They walk in with the TV camera and they ran into [the subject's] place and they were

arresting him and they didn't let him turn down the BBS. They're shooting a screen where the CD-ROM was mounted and they say, "Here's pictures of people downloading smut," — just great press. They produced their own show and had it shown that they were busting him. He went on trial and the on-line... apparently there was an on-line component and there was a selling physical CDs component.

The on-line component really didn't go anywhere but he did sell a couple of CDs which, according to the fairly conservative standards of Oklahoma City, were considered obscene. He got sentenced. One thing that kind of sticks in my craw over this one is that the CD-ROMs, at least a couple of them, they were described, you know, the titles were given. One was called Busty Babes. You could look in the back pages — I'm not sure you could do this today — but you can look in the back pages of PC Magazine, of all publications, and they were there advertised. Any bulletin board operator — you know, these are regular guys, these aren't lawyers. If they see something advertised in a national magazine that is kind of out there and public, they're to be approached by police if they're doing something wrong. This stuff was being openly sold. He just buys some of this and resells some of it, makes some of it accessible to people on the bulletin board. Next thing you know, he's popped. That's the kind of experience, by the way, that more on-line people will be having as the police become more familiar with on-line environments.

The other interesting one I'll mention here, another bulletin board case just on the way, went the other way — partially the other way. There was fellow in Arizona named Lawrence Chance who was a state trooper who had a bulletin board and apparently had some adult materials. He had his stuff — his bulletin board — taken because of allegations of distributing obscenity. As a state trooper he lost his job, and he lost his pension, just from the fact that he was under suspicion of distributing obscene materials.

The prosecutor went to the Grand Jury twice to try to get an indictment, and the Grand Jury refused to indict because there was a real hang-up on the knowledge issue. He knew these were adult material CD-ROM, but whatever images these people had in mind, there was apparently no prospect that they could show he knew the particular images. These CD-ROMs could have thousands of images — with no prospect of showing that he knew those particular images were on there — the ones that they picked out, that they said were really bad news. It would be like saying, you know, someone buys an issue of *Playboy*, I think most people are familiar with the range of images in an issue of *Playboy*, none of which are obscene. Then they stick an obscene picture in there for a laugh. Is the buyer of *Playboy* supposed to understand? Is this newsstand selling *Playboy* supposed to take the risk that there is one obscene picture sprinkled in among the obviously much less hard-core images? He got off. They just dropped the thing altogether, no charges, no indictment. I guess he got his computer back, although I think he's still out a job and a pension. Last I heard, he was looking to sue the people that put him in that position.

The last thing I'll mention is a privacy angle here. I kind of mentioned it briefly already; when this bulletin board was seized, the private messages and files of hundreds and thousands of people were kind of swept up. We're back in Cincinnati now with this bulletin board — I forget the name of it — the Cincinnati bulletin board — and all these people had their private messages seized and potentially looked at. Now these users in this class action suit are alleging that they have privacy rights under something called the Electronic Communications Privacy Act. Ken's going to be discussing that Act in more detail than I would even want to get into right now.

I'll just mention, for the purposes of this case, that the Act distinguishes between intercepting something while it's being sent and taking something off the computer while it's in storage. When messages are in storage, the rule basically is: if the government wants to get at those messages, if they're less than 180 days old, it needs a warrant from a judge. If they're more than 180 days old, they can do it kind of out of their administrative subpoena and they're supposed to give notice — advance notice — but there are a lot of conditions under which they don't have to. It doesn't seem like they did any of these things. It's not certain yet; all the facts haven't come out; but it doesn't seem like any of these things were done when the bulletin board was taken.

One of the interesting things about the Electronic Communications Privacy Act is that if you have thousands of users each one of those people has rights under that act. So if you take a bulletin board with two thousand users, e-mail on it, private e-mail stored on it — and there were two thousand people whose rights that properly the government should be dealing with before it would maybe even take the bulletin board physically and certainly before it would even dream of looking at any of that stuff. And [the government] should give a reason to each of these people as to why it should be looking at their, or taking their e-mail.

The other issue that came up — the other major claim which is kind of interesting — is the assertion by these users of the bulletin board they have a First Amendment right to peaceably assemble. That's built into the First Amendment. It's not as famous as Freedom of the Press, but we have a right to get together and talk over things — political things and other things. So it wasn't just the private e-mail, it was also group discussions, group interactive situations. When the bulletin board was seized and put out of operation, obviously, all these interactive discussions and conferences and get-togethers stopped on a dime.

This computer bulletin board was supporting the get-together. It would be like somebody came and took this building out from around us and our seats and we were all kind of in free-fall — not in the same place any more. We wouldn't be able to interact very well. That's, in a sense, what happened when the bulletin board was taken away. They are also asserting that that right was infringed by the action against the bulletin board. So in that case — in the Cincinnati case — two questions are: Can government agents ignore the individual privacy rights of thousands of bulletin board users in their pursuit of on-line pornography? And also: Can government agents ignore the rights of thousands of users to congregate with each other in the pursuit of on-line pornography.

So, I know it's kind of fast and sketchy, but hopefully that will give you a flavor for some of the current issues that are happening, a little bit of the history and we'll have question-and-answer sessions a little later on if you want to talk about more specific things. Thank you.

Wayne Martino: Our next speaker is Ken Rosenthal who is a partner of mine. Ken does civil and criminal litigation and he will be addressing computer crime.

Kenneth Rosenthal: As somebody who has practiced in criminal courts for many years, sitting and listening to stories about what's been happening recently, or reading about them in connection with computer-related incidents in law enforcement is troubling, but not totally surprising. I say that because there is an element of, "Maybe it's just in the nature of having a criminal justice system under any circumstances," an element of discretion and of arbitrariness that can seem very unfair at times. There are times when

I think anybody who works in this system says to themselves, "It seems like the people who should get punished are not getting punished and the people who are getting punished shouldn't get punished." You have many areas — as I said, it's partially in the nature of the system — but I think that there are some aspects of trying to apply old criminal laws, established laws, to this technology revolution that just aggravates those problems in the extreme; and I'd like to talk this morning about two aspects of that.

One is the substantive criminal law as it is being applied or has been applied and has been amended and changed, to the Internet and to bulletin board operators and to situations related to that. The other is: What is the law as it exists and as it's been amended? and another is the way it works in the criminal justice system — kind of on the street and in its implementation, because I think that's where, in some ways, the problem is the greatest at this point. Starting with the law, there was a problem and there still may be perceived to some problem, but I think it's mostly been eliminated, with applying traditional criminal law notions to information "property."

Larceny, for example, which was one of the laws that you find — larceny concepts are in the laws that were being applied to the misuse of computers or illegal acts with respect to computers — larceny has some elements, at least traditional elements, as most judges and courts and lawyers have been used to dealing with it, that require there to be, first of all, property and second of all a permanent deprivation of property.

That is, you have a piece of property that the owner has a property interest in and the thief has taken the property and permanently dispossessed the owner of it in such a manner that he is guilty of stealing. Of course, the problem with a lot of the computer crimes that those statutes were originally applied to was that the owner hadn't been permanently deprived of anything; or at least it was difficult to say what he has been deprived of, because the information or the data that someone may have made a copy of was still resident on the owner's computer. The case that some of you, I'm sure, have heard of and that we may talk a little bit more about this afternoon, the Stephen Jackson Games case — or looked at from the criminal side, the [Riggs-Nederdorf] prosecution — involved that type of a situation to some extent.

Bell South Telephone Company had on its computers the instructions for how the e-911 — the emergency phone system — operated. Law enforcement became concerned because they were told a college student had accessed that computer without authorization, had made a copy of that manual on the e-911 system, had transmitted it to another young fellow who was a college student but also published a magazine — *Frack*, I guess, was the name of the magazine — and he, in turn, had put it out over his electronic magazine to many, many people all over the place.

The Secret Service, which is the federal agency along with the FBI with responsibility for enforcing many of the federal computer-related crime statutes, got involved along with other federal law enforcement agents and brought a prosecution. Prosecution was brought against Riggs and Nederdorf under, at that time, a number of federal statutes, one of which was the interstate transportation of stolen property, another of which was the wire fraud statute.

The wire fraud statute, as it has been construed, includes an element of some kind of property, although that property can be fairly intangible. One of the issues in that case was whether [Nederdorf], when he was being prosecuted as the magazine distributor, had taken something of significant value, because the interstate property statute also has a requirement, common with larceny statutes at that time, of a certain amount of value. You have to transport something across state lines that's stolen [and

which is] worth more than \$5,000. It quickly developed in the course of the trial that this supposedly highly secret e-911 document was a document that was readily available to the public by the simple practice of dialing an 800 number that Bell South had available and paying \$13 to get a copy of it.

So, one question was, "What property has been taken?" The second question was, "What's the value of that property? Well the value of that property at most is \$13, if that's the price they're charging the public. That was the end of the [Nederdorf] prosecution for all intents and purposes.

Now Riggs, the fellow who had accessed the computer without authorization, had pleaded guilty, and maybe wisely so, because there was also an unauthorized access to computer count that he had to face under the Computer Fraud and Abuse Act. That is one example of a case where traditional theft concepts, or larceny concepts, don't have an exact fit. They definitely don't have an exact fit when law enforcement jumps to conclusions that aren't based on the facts.

As a result of enactment of a lot of statutes and changing of statutes that weren't originally covering what people thought they should cover, there is now a fairly sophisticated, complete and computer-specific set of statutes on the federal and the state level, that are available to deal with (a) unauthorized access even if nothing is taken, and (b) to address issues of value that are harder to define when you're dealing with these kinds of pieces of property.

The thing I'd like to spend a little more time talking about is what I think is the real problem here — and it's a problem that hopefully can be addressed as time goes on — which is that law enforcement, in enforcing or applying criminal statutes to the computer area, doesn't tend to get involved on the local level; and tends to get involved on the federal level only when you have these highly publicized cases.

It's as if, in a way, the only law enforcement that you have going on in the world of Internet information superhighway transactions are the O.J. Simpson kind of cases — the cases that get lots of publicity because somebody in the relatively small law enforcement community at the federal level, which has the resources to deal with this, sees something that's big enough — or that they think is big enough, or that they magnify into being big enough to pursue, and that there is not a lot of interaction or knowledge between local law enforcement, which is where most law enforcement occurs, and the people who are perhaps legitimate victims of problems with computer crime. And that's a problem that's been addressed.

It's been noticed by the National Institute of Justice and others that computer crime is different; it's more difficult to pursue, so local prosecutors and local police don't tend to pursue it. What tends to happen is it's only these highly publicized and sometimes not really appropriate cases that get pursued by the Secret Service and the FBI when they think there is a point to be made.

The reasons for the problem — or maybe the ways to address it — are several. I've been involved and I'm sure many of you, not only lawyers but business people, are involved at times with trying to get law enforcement to take up a legitimate problem that you have. When the problem is a problem involving complexity, you don't find local law enforcement jumping on the bandwagon because they have enough to deal with, they feel, with regular street crime. They're familiar with that, and they don't understand — or are not equipped to handle — the putting together of a case sufficient to meet the standard that they have to meet in order to prosecute somebody.

There's a sign, I'm told, in some Arizona District Attorney's office that says, "Low-tech solutions to high-tech problems," meaning that they have few resources and

little sophistication, unfortunately, to deal with the high-tech problems that they are increasingly confronted with.

There may not be any easy solution to that, but I guess what I take away from the Stephen Jackson Games case, and from the cases that Lance was talking about and the cases that you read about, is that the day-to-day interface between this world that's growing increasingly and will have some real concerns about people committing conduct that requires that at least such conduct should be controlled by some type of criminal sanction if a true property interest is being violated — that if you don't have an existing day-to-day practice that is dealing with that, so that law enforcement is familiar with it — that you get the kind of aberrant case, here and there, that does the kinds of inappropriate things Lance was talking about, that you have in the Stephen Jackson Games case.

The materials that are provided here, for those of you who have them, have a listing of these various statutes. It's something that is not... each state now has computer fraud and abuse statutes of one sort or another. They differ from state to state, in addition to the federal statutes. There are state task forces; there are resources available for getting assistance with prosecuting these cases, but I think in the end it's a matter of the same type of thing you have when you have an embezzlement case or a business crime that law enforcement isn't going to pick up by themselves. It's more a matter of those people who are the victims of those crimes working more closely with law enforcement than usually happens, perhaps putting the case together and doing the investigation.

I also put some information in the materials from NIJ on what is required in order to gather evidence in a case of this type, putting that evidence and sort of presenting it all put together, so that something does happen if it should happen; because in the run-of-the-mill, more appropriate case it won't happen unless there's somebody who puts in that kind of input. So in addition I gave you a chart of the state statutes as they are in each jurisdiction, with indications of what kinds of categories they cover along with a description of the federal statutes and an excerpt from an NIJ publication on what types, from law enforcement's point of view — what they need in order to pursue these things.

The thing to be aware of in becoming, perhaps, open to gathering evidence and putting together a case is that there also are some very strict requirements in connection with the collection of this evidence, and in connection with law enforcement's activities in connection with collection of evidence.

Lance made reference to the Electronic Communications and Privacy Act. We're going to talk a little more about that in a little more detail this afternoon. Criminal law depends a great deal on the gathering of information and on the maintaining of the integrity of the information and on the observance of procedural rules. On the other hand, that doesn't tread on the privacy and the Fourth Amendment interests of citizens.

Probably the best example that we study in law school of how the courts have applied old principles of law to new technology was the case of *United States vs. Katz*, which is the case we studied in law school — a case that involved the federal agents putting a listening device on the outside of a glass-enclosed telephone booth. This was many years ago, and at that time the law relating to search and seizure was that, in order for there to be a search, such that the Fourth Amendment would apply at all, such that somebody could complain about evidence that had been gathered and seek to suppress it, you had to show that the government had intruded on property, literally on property, by trespassing in some way on property.

In *Katz*, the court said that rule just doesn't make any sense in the age of the telephone and wire communications. It's a resounding decision in favor of the application of the Fourth Amendment principles from the beginning of our Constitution to a new age. What they said is it's the legitimate expectation of citizens in privacy when they go into a phone booth. Even though it's a glass-enclosed phone booth, a public phone with everybody being able to see them, they have the same expectations of privacy in that setting as if the government had gone in and put the wire tap inside their own private home.

Building on the *Katz* case there was created the federal wire-tap statute, which created very stringent requirements for government or anyone to intercept, using an intercepting device of some kind, to intercept the contents of communications. It was originally oral and wire communications and then ECPA amended that wire-tap statute to include electronic communications. It's a very complicated statute; it always was, and ECPA didn't make it any simpler. It has lots of different provisions that you have to read in conjunction with each other, but basically what it says is that in order for government to intercept — well, nobody can intercept somebody's private wire communications, and the felony penalties are severe for private citizen as well as for the government.

Government agents, in order to intercept such communications, have to go through a number of steps. In order to get a wire-tap order out of a court, there are all kinds of limiting rules that apply. Unlike a normal search warrant, you have to show a judge you're going to make efforts to minimize what you listen to — only pertaining to what the crime you claim you have probable cause to investigate, that there were no other reasonable alternatives to gathering the information in that way.

A layer of complication that ECPA added onto this statute is that, as Lance mentioned before, it has two categories of electronic communications. They had wire communications and oral communications.

When they added electronic communications, the important distinction is between communications that are ongoing and communications that are in storage. What that means isn't as significant as it may sound when you hear what happened in the Stephen Jackson Games civil action that was brought.

Getting back to that case, because ECPA comes in to play, the Stephen Jackson Games bulletin board was located in Austin, Texas. Keep in mind that Riggs and [Nederdorf] were being prosecuted up in Illinois by federal agents. As part of the investigation, the federal agents obtained a warrant from a judge that authorized them to seize — and this is the wording of it — “computer hardware, computer software and documents relating to the use of the computer system,” and this is even Jackson Games' computer system and certain other documents relative to the computer programs and equipment which constitute evidence of federal crimes. This warrant is for the seizure of the above described computer and computer data and for the authorization to read the information stored and contained on the above described computer and computer data.

The reason that the federal agents sought to obtain a search warrant in the first place was because they had information that an employee of Stephen Jackson Games — which was not simply a bulletin board, it was also in the business of publishing books relating to certain kinds of computer games — that an employee of that company at his home had a private bulletin board which they thought was also engaging in activities related to the distribution of this 911 document and connected with the Legion of Doom people, whom they saw on the periphery of this action as well. In executing a search warrant there was no advance notice, as there usually is not, and agents appeared at Stephen Jackson Games and basically took the company's computer system, including

not only the computers and the disks on which documents and data were stored but also laser printers and modems and other devices that could have no conceivable— if you knew anything about the computer system — would have no conceivable relevance to the investigation.

Stephen Jackson Games was not a suspect in the case; he never was accused of a crime. It was a third party that had what law enforcement felt was evidence that was related to a crime. There is case law that goes back some years that search warrants can be executed not only on the premises of criminals for contraband but also [on the premises of] third parties, any of use are subject to having a search warrant executed if law enforcement can satisfy a judge that we are in possession, knowing or unknowingly, of evidence as well as contraband relating to a crime.

Stephen Jackson Games then sought to get this equipment back, explaining that [the company] needed it in order produce his business. On this equipment was a book that was in the process of being published and other important things, and on this equipment there was a bulletin board that was basically a customer service for the people who bought their publications. [There] was e-mail, including undelivered e-mail — more than 100 pieces of undelivered e-mail.

It took Stephen Jackson Games more than four months, despite the fact that they were working with a lawyer and had contacted their Congressman or politician to try and get the government to give the equipment that had been taken. It required them to lay off approximately half of their employees for an extended period of time, and they sustained, obviously, extended damages; so they brought a lawsuit, because, under ECPA and under a Privacy Protection Act, you can recover civil damages for violations of the statute by anyone including the government. If you can't prove actual damages there is a provision under the improper interception of in-transit communications of \$10,000 per incident, under Title 2, relating to stored communications. It's a lesser amount — \$1,000 per incident.

They were successful, by and large, in the district court, in having a judge award them damages for the seizure of this equipment without observing the ECPA requirements, because in order to intercept this kind of data as I said before, the wire-tap statute requires more than simply a warrant that says, "There is probable cause to believe there is some evidence there; we want to seize it!" It requires a showing that you're minimizing what you are taking, that you have no alternatives to taking it. There were very complicated procedures that were not observed there because law enforcement didn't concern themselves with that.

There is also an aspect of the decision which gets into more of the details of the statute that says under ECPA, stored communications as opposed to in-transit communications. Let me put the other way; we might think that in-transit communications would be e-mail that's undelivered. I'm sending you a piece of e-mail that's sitting on the Stephen Jackson Games computer and hasn't come through to me yet, I haven't picked it up yet. That would be considered in-transit communications for which there is greater protection, but a close reading of this statute according to this court at least — and there may be some basis for it — is that the way the statute is drafted with the combination of definitions and provisions, is that the only thing that qualifies as in-transit communications is when the data is actually moving over the lines and that whenever something is in temporary storage, including undelivered e-mail, it has a lesser status — still protected, but a lesser status of stored communications. So Stephen Jackson Games and the customers who joined this lawsuit recovered damages, but not quite the damages they were entitled to.

I mention that because it again reflects the fact that we have statutes out there that deal with these issues. There is a gap between the rapidly changing technology that's out there and the statutes and the knowledge of those who apply the statutes. The only way for these troubling events to be reduced, and not to increase, is for people who are in the world of the Internet and the world of these communications to, in a sense, educate law enforcement by seeking to have them observe what the requirements are and by educating legislatures to change the statute, if it needs to be changed, to be consistent with what the reality is.

I think that's basically what I was going to say today. We'll talk some more this afternoon about, if you're a systems operator, what you do in response to a warrant and what you do in response to a subpoena.

Wayne Martino: The next speaker that we have is Margie Seif. Margie is at AT&T On-line Network and they've just opened up a business network today. She's been doing this for a while. She was at Ziff Davis prior to that. Margie's just going to be giving you a general overview of things that she encounters on a day-to-day basis in the course of her representation.

Margaret Seif: I actually had asked to be moved from the 12 o'clock spot because I hate playing to the lunch-time crowd, but here I am playing to the intermission crowd. Because this is a long session I invite you to just raise your hand in the next 20 minutes while I'm talking. Feel free to ask me questions, because I may not be able to stick around for the whole Q&A session at 12:15.

I've been an in-house lawyer for an on-line service provider since 1993 and, as Wayne suggested, at the first we were content providers. Ziff Davis had its own on-line service called "ZIFNet," now called "ZDNet," on CompuServe, Prodigy and Apple's eWorld service. We were also developing an on-line platform to launch our own on-line service and Ziff Davis was sold in four different pieces in late 1994 and the platform software piece went to AT&T, and I went with that company. We turned into a hosting company that allowed publishers to put their own private branded services up and get their own subscribers; and if you wish you can subscribe right now to the *Washington Post's* service on our network or Ziff Davis has a service called ZD Interchange and a few other ones.

As of today, AT&T launches its first branded on-line service called the "AT&T Business Network" and I find myself now in the business of being counsel to an on-line service provider that's a content aggregator, not unlike AOL or CompuServe — an entity that gathers content from all kinds of providers and puts it together in an attractive package for users; so I feel I've seen it from all different angles. As I said, feel free to just raise your hand while I'm talking, and we can make this a more interactive little discussion.

In any event I have a worry list as in-house counsel for this kind of volatile industry. You would expect that the list changes from time to time; my list of worries last year was prioritized differently than the list this year, but the one message that I have for all of you is that the big on-line service providers like CompuServe, Prodigy, AOL, AT&T, Microsoft, face liability issues that I'll talk about.

You'll hear more from this panel, but really these problems are no longer just our problems. They are any content provider's problems who wants to put information up on a service, a commercial on-line service or on the Internet or on the Web, because increasingly, content providers — and I'll take my old alumni, Ziff Davis —

they're finding out that it's not enough to just take your print content and re-purpose it in an on-line medium. It doesn't really work terribly well. What content providers are finding that they have to do is make the content come alive on-line by adding interactive features like discussions. There might be chat. They find also that software files to accompany that content are very helpful to make it an interactive experience, so often they'll put up sound clips or video clips that go along with the print content that's up there, the editorial content. Increasingly, purveyors of content are finding that they need to subsidize their activities, because maintaining a Web site doesn't really pay for itself these days; so increasingly content providers are turning to advertising as a way to subsidize their on-line activities. Everybody is looking for that brass ring called "e-commerce" or transactions as another way to subsidize their on-line activities.

So when you put that whole package together you suddenly see that someone that might have thought of themselves as merely a content provider, with a Web site or a place on an on-line service, is starting to look a whole lot like an on-line provider themselves; as such, the problems I'll describe to you become the problems that are universal to anybody trying to do anything on-line.

My favorite saying is that Andy Warhol said that in the future everybody will be famous for 15 minutes, but I say that in the future everybody will be an on-line service provider because nobody, I think, in the next few years, will be without a Web Page, and that probably means every one of us human beings just sitting here, not to mention the companies that you all work for.

Just to give you a thumbnail sketch of some of the top three kinds of content worries that I have on a day-to-day basis, in no particular order of priority, would be: content that infringes copyrights or trademarks or trade secrets of a third party; potentially defamatory content, and obscene materials. I won't go into too much detail about the legal standards surrounding all of these various problems but I'll just give you a sense of what it's like in the trenches, every day, to deal with these kinds of issues and to try and do business in this environment.

With potentially infringing materials, material that's alleged to infringe a copyright or a trademark of third parties, I've found in the last few years that, really, the problem rarely will come up in the context of a content provider that is licensing its own content or, in the case of an on-line service provider, is the licensee of that content. To protect against it, I get a very full-blown indemnification from any content provider on our service, or from any publisher of a private branded service, and that indemnification covers every kind of problem that could arise with that content, including copyright infringements.

Where the problem has come up more frequently is in the member contributions that come onto the service, whether it's in the form of bulletin board postings or software files that are uploaded as shareware or as some other kind of distribution.

I find that we've had some interesting situations come up where a member will post a piece, maybe take a whole piece verbatim, like an article that they have seen, and they post it because it is germane to a discussion going on on the network. And then underneath that posting they will put copyright with the year and the name of the owner of that piece because to that member's mind, they are doing the right thing by citing the owner of work. The problem is that they never got permission from the owner of the copyright and so we have to tell them in a gentle way that they did the wrong thing and we take it down.

It also comes up in the context of shareware files or other kinds of software coming up on the service. People, I've found, that are very interested in creating shareware — and I don't want to malign the shareware community — but a technologically savvy group out there, they sometimes will take copyrighted elements that they've seen somewhere else and incorporate them into a novel kind of a program. It might be a screen saver, it might be game and they think it's their own work because they did create the program. They created the game and they created the software that makes the game run, only they never got permission from the owner of those characters that you've seen on TV shows or in the movies.

Again, we have to teach them; it's an educational process, but we have to teach them that they do have to go and get permission from Fox if they want to use the *Simpsons* or from Paramount if they want to use *Star Trek* characters, for example, and I don't think that Paramount will be too quick to give permission to Joe Smith in Padooka, Kentucky to create a screen-saver, because those kinds of large entities that hold copyrights and very valuable, recognizable characters want to exploit those characters themselves and don't really take it very well when others are creating products around their intellectual property.

I've also found that members have a very flexible understanding of what the term "fair use" means. Fair use, in a nutshell, means that there are certain circumstances where you may not have to get the copyright owner's permission before you copy or display the work. But there are standards surrounding what would be a fair use. They are very squishy, broadly defined, hard to define standards that a court would apply in a case brought by a copyright owner; so we urge people not to take what they consider to be a snippet of something because they think it's fair use and put it to some other use and post it on our network.

You may ask me why I care so much about what our members are doing. The answer is partly because members can get into trouble with copyright owners; and it's not in our interest to start a situation going that can escalate very quickly, but I care also because the copyright statute is a strict liability statute, meaning that, as the on-line service provider, we can be found liable for that infringement just as the member who posted the infringing work would be liable.

And, you may ask, "Who would the copyright owner feel that they could get more damages from, or do better in a case against? Joe Smith from Padooka, Kentucky, or AT&T?" I would guess AT&T looks like the deeper pocket most times, so I care very much. With the other on-line service providers like America Online and CompuServe and Delphi, we worked very hard to get the Clinton administration to pay attention to our concerns because they were promulgating what is now called "the White Paper" which suggested reforms to the copyright law in a digital age.

The Patents and Trademark commissioner unfortunately did not take the on-line service providers concerns very seriously and instead came down very hard in their report in favor of copyright owners' rights in a digital age. So again, the liability issue remains for us, and for anybody putting up a Web site where content in the form of editorial content or pictures or discussions are occurring.

The second sort of broad things I worry about is potentially defamatory statements made on the service. Again, I worry less about that from a purveyor of content like *The Wall Street Journal* who's going to be up on our AT&T Business Network because we have very broad indemnification from them and they carry what is called liable and slander insurance to cover this kind of problem. I worry about it much more in the context of bulletin boards maintained by us, where members can engage in

discussions and post whatever they want without that content being screened by us prior to posting.

You've heard something about the Stratton-Oakmont case against Prodigy. I won't go into the details here except to tell you that the court cited against Prodigy the fact that Prodigy has pre-screening software that they use before postings to bulletin boards are permitted up on the service. They have pre-screening software that looks for certain dirty words or racial epithets and the court found that that contributed to Prodigy looking like a publisher of the defamatory statements as opposed to a distributor of the defamatory statements.

You've heard that the case has been dropped, but this decision remains on the books, that Prodigy was a publisher of the statements, and so was subject to the same liability as if it had uttered those statements itself. We're looking for reversal of that decision and again, the various on-line service providers through the Interactive Services Association have filed an Amicus Brief saying very clearly that to leave this holding on the books would be incredibly problematic for our industry; but we're just waiting to hear and we don't have any resolution yet.

I look at that holding and I say to myself, "We have to start retraining our sysops, the people we use to monitor the boards, teach them a little bit about what defamatory content looks like. It's impossible, in fact, that anybody, any sysop or anybody else that's just monitoring the boards, can determine the truth or falsity of the statement in this kind of on-line context. It's just impossible.

We don't want to get into a situation where we look like we're censoring. It's not good for the on-line medium if the on-line service provider does not really permit free and open discourse of issues. If it looks like we clamp down every time there's something vaguely inflammatory up there, then we're not going to become a place that people want to visit and congregate and do their business and get to know each other. The defamatory content issue remains with me.

Every day we sort of worry a little bit more about some postings and we look at them, and the good news is that most of the postings never reach my desk. We have people who are very good at sort of gauging the level of discourse on a service, and we have member agreement and operating policies that set forth the terms under which subscribers should conform their behavior on the network, so there's a level of civility that we feel should be maintained. To the extent that postings seem to violate that standard of civility, we do take action, but it rarely comes from my office.

The third broad kinds of content problems that I've seen have to do with obscene content. Thankfully I don't see it on my service very much, but even though we are a proprietary platform — and I know that that's a dirty word these days — we are Internet-enabled. We provide the Netscape browser with every single subscription to the service, so anybody on our service can go out to the Net. They can go to the alt.sex news groups if they wish; they can download whatever they wish from that area of the Internet and they can store it in their e-mail, just like the subscribers did on America Online. Nobody is immune from this kind of material making its way onto their proprietary platform if they didn't license it.

With all the legislation that's suddenly emerged this year, we had it high on our radar screen that obscenity would be the next big issue, but I think that every single one of us in the on-line services industry was taken aback by the number of bills and the flurry of publicity that surrounded each one of the new legislative endeavors that was promulgated this last year, and we were very disheartened by the way the tenor of the

debate was going on in Washington. Those bills in their original form would have provided for criminal liability for anybody making obscene material available to a minor.

From all of our reads of those statutes, it meant that if I provide access to the Internet and somebody downloads a problematic file, and it's a resident on our e-mail system or somehow cached in a server, then the president of my division could go to jail for that. That seemed to me to be a very problematic result.

We worked hard as an industry to educate the legislators; and there was in fact a bill promulgated called the "Cox-Biden Amendment" which encouraged the development of blocking technologies rather than censorship, because you cannot censor the Internet. You can shut down a server in the United States with obscene material, but you cannot shut down a Finnish server. Instead, we should work to develop blocking technologies that parents could use to turn off content they found to be the wrong kind of content for their children. And we still remain in favor of that. The bill is in conference; we don't know what it will look like when it comes out, but I do maintain some hope for that. I think that the technology is coming along and, in fact, "NetNanny," I see, is here at an exhibition booth, so I may stop by and see what their blocking technology looks like.

That's my perspective from somebody who does this every day. If you ask me what my predictions for 1996 problematic areas will be, I'd put high up on the list taxation issues. States are looking for revenue. They need revenue, and they're looking at on-line service providers and Internet access providers to give them that revenue. Canada, for example, is trying to impose a tariff on any service that carries music, and the tariff is exorbitant. It's 25¢ a subscriber, no matter how much music. If you have one music file, ostensibly you could be subject to this tariff if you go into Canada — at 25¢ a user — or, if you're supported by advertising, I think it's something like 3.2% of all your gross revenues, so it's completely outrageous and we're working hard to get that squashed. It's called an experimental tariff, but I don't think we want too many experiments like that cropping up and flourishing because we'll be run out of business if we have to pay a tax collector and a tariff collector every time we do any kind of transaction on-line.

So taxation is a big one for next year, and I would believe also that privacy is going to come to the fore again. There was a problem last year, you might recall. America Online made its subscriber list available for rental, which is not an unusual thing to do. Many big companies do it. It's a good revenue generator. But the way that they advertised that the list was now available for renting gave users the impression that their individual data as to how they use that service would be subject to rental; meaning that if Joe Smith logs on to AOL and always goes first to sports and then goes to news, that kind of per-session information would be disseminated.

In fact, that's not the case, but it got Representative Markey in Washington very interested in privacy. He's no longer the head of the committee that was investigating this, but that lead to the industry saying, "No, we will never market per-session usage. We believe in respecting the privacy of our members." It was a misunderstanding all the way around, but I believe that privacy in some other forms is going to rear its head in 1996, and that'll keep us busy.

In a nutshell, every day is completely crazy. No day is like any other day in this job. There's always a new issue to keep you jumping and we're also trying to launch a product in the midst of all of this, so I hope that you'll go out to the booth and see the AT&T booth. We are making today available commercially launching the AT&T Business Network, which we think is just a terrific product, and I hope to see you all on-line.

Wayne Martino: Our next speaker is going to be Anne Branscomb. Anne Branscomb is at Harvard University and she is in the program on information services and resource policy. Anne has been involved in this area for a while and has written extensively, including law review articles in the *Georgetown Law Review* and *Yale Law Journal*. I'll turn it over to Anne.

Anne Branscomb: Thank you very much. Well, I think I'm asked to address only one legal issue today — or one that interacts perhaps with some others, and that is how we treat advertising and the First Amendment.

I guess we start out with "What is the First Amendment?" It really is an amendment to the U.S. Constitution, so the real question is how does this apply to a global network. It really has a very limited effect. It reads that Congress shall make no law. It certainly doesn't say that Parliament shall make no law or the Knesset or any other legislative body in the rest of the world that might have Internet messages there.

It speaks of abridging the Freedom of Speech and of the press, so I guess a threshold question is, does this cover the Internet or computer mediated communication at all? I think that there's no doubt that, under the U.S. interpretation, certainly on-line communication would be treated as speech. But the First Amendment, even if we look at just how it applies in the United States — it really is not a guarantee, it's a guarantee of the right to speak. It's not a guarantee of the right to be heard or a right to be viewed, so it's not really a right to be invasive, as far as individuals are concerned, into what they might consider their own private space. It does imply a right to distribute information, so there's no question that there is certainly a right to put advertising on the Internet.

Now, the First Amendment does run headlong, I think, into rights of privacy, and these are still in their primitive stages — just being developed. Although there are roots in the U.S. Constitution which go back historically, it's only in this century that we've expressed much interest in privacy. It's possibly because we only lived in small towns where people knew almost everything about us anyway, and we're only beginning to recognize the question of privacy and right not to have intrusive messages put into what we consider to be our private space. I think that people are claiming more autonomy over their own information, and as Margaret said there will be a considerable interest in the future in maintaining such privacy.

Now, how does this apply to advertising? Historically we've looked upon discussion as a marketplace of ideas or a market of information. This is certainly very consumer-oriented and I think we are in a mode in which we tend to favor consumer decision in terms of what is available. But historically, the First Amendment really goes back to a protection of the political life of the nation in terms of making public policy decisions and [discussions of] controversial questions of public interest. Commercial messages have only recently been held to come under First Amendment at all, though there, at least, a marketplace is something to which you invite people to come. It's not something that comes to you, and I think this is one way I look at the opportunities on the Web as offering a genuine marketplace to which people can come and find almost anything. Certainly, as this conference and World Trade Center activity suggests, advertising is coming to the Internet fast and furiously.

I think as we see this developing we're also seeing that we're coming into an environment in which there has been a great antipathy to advertising from the very beginning. Historically the Internet was governed by the acceptable use policies which

were for research purposes and education and not for exchange of commercial messages. They were in fact prohibited, but we all know that more than 70% of the sites now, or the domain names on the Internet, are of commercial interest. But a lot of the pioneers on the Internet don't like advertising anyway, and when they find it coming into the Internet they take the law into their own hands.

If you remember correctly a year or so ago, Kantor and Siegel, who were two lawyers in Phoenix, Arizona, spammed the UseNet groups. "Spamming" means throwing a piece of spam in front of a fan, which sends it in all directions. The people were very upset about this, because many people subscribe to different UseNet groups, and therefore they were receiving multiple copies of this advertising and they got very upset. There were flames; they stuffed the voicemail; they stuffed the e-mail of the Kantor and Siegel group.

One man designed software that would delete all the messages that came from that group, and eventually their server actually canceled their access to the Internet. Just earlier this year they went back and tried once again using a source that was not identified as Kantor and Siegel, so that it was somewhat deceptive. They in fact put messages into the equivalent of the 911 system, the management software for the Internet, saying that this was an okay message to be distributed, and it was actually distributed into the files which went into their distribution list for all of the publishers that they were trying to reach for their own dissemination of messages.

It actually was picked up so quickly by people who realized that this was Kantor and Siegel again, and the messages were being returned to their site, that their server canceled their service once again very quickly within 24 hours. Not very much of that got into the press. It's very interesting to see how much antipathy there has been on the question of advertising coming into that, particularly into e-mail and to conferencing groups.

Now, there is one question. I think one of the users had said it was sort of like opening your mailbox and finding hundreds of letters with postage due. There are some differences between e-mail and direct mail. There usually is a cost, there are limitations on the size of the e-mail box and so forth, so I think it's to some extent very similar to the situation that we found in the 1920s when radio first came on board and everybody was talking on all the airwaves, and there were so many conflicting messages going out over the radio that nobody could hear anybody, and the broadcasters were actually seeking some form of regulation.

So I guess we have to ask the question, "What really is acceptable behavior in terms of advertising on the Web and what are people likely to accept?" Of course advertising will be subject to laws governing advertising in other media which are largely regulated through the Federal Trade Commission. There some rule-making proceedings going through the Federal Trade Commission as to how the rules would apply specifically to the Internet and to commercial messages on-line.

Certainly, we won't permit fraud and any of the things that we have long since recognized as improper. There are some global implications, however, in terms of what may or may not be prohibited in other parts of the world, because once you put something on the Internet, it's certainly available in — I've forgotten how many countries it is at this point. It was well over 120 last time I looked. In France, for example, it is not permitted to place any comparative advertising, and that has become permitted in the last few years. We originally had such a rule but we changed that so that you can put comparative advertising. I think in France, also, ads have to be in French, which makes it a little bit difficult, although I understand the software is quite

capable of translating the languages. I read the other day that *Monopoly* is going on-line so you can play *Monopoly* in any one of seven or eight languages, and play interactively with people from different countries, so I guess the software can take care of some of this.

But what are advertisers actually doing on-line which is really very interesting? As Margie said, nobody's really making any money yet about trying to advertise on-line. Everybody is going to the Web, and it seems that what they're doing in order to not annoy the natives, so to speak, is offering free information, because information on the Internet has largely been considered to be free. I mean "free" in the sense that the end user is not aware of the costs that are associated with the exchange of the information on-line, because it's largely been in an academic environment. But it is very interesting to take a look at some of the different types of ads.

I'm sorry I didn't drag my computer along; I do have some pretty pictures of some of these but I suspect most of you have searched the Web enough to know them better than I do. There are such things as the "classic car site," which not only has classified advertising for all the classic cars all over the world but offers information about all the rallies you can go to and has little stories like "The Classic Car in Africa." They're beginning to offer a cluster of information — some of which is free — and expecting the cost actually to be — I mean, it's presumably supported by either classified ads or sites that are offering rallies and sponsoring them and so forth.

Godiva is actually offering free recipes on-line. My research assistant last year said he would download all the recipes but he didn't think he'd ever go buy any Godiva chocolate because it was too expensive; so if everybody behaves the way my research assistant does, Godiva won't make much money out of its Web page either.

Many of them are now turning to advertising on-line. I understand there's a good bit of advertising — it's fairly costly now — on the ESPN Home Page. *Hot Wired* obviously is collecting data on what sites one is interested in because when you sign in on *Hot Wired*, you have to give your e-mail address and have it verified and you have to have a password to get on it. I understand that *Time's Pathfinder* Page is going to something like that. I haven't looked at it recently so I'm not sure at what point they are.

But obviously it appears that the Internet is moving in the direction that television has gone — and radio in the past — of largely aggregating audience to sell to advertisers. So the question is: to what extent does this affect the purpose of the First Amendment in where you have a public forum and whether or not the purpose, as a free expression, will somehow be lost in this overwhelming control over the content by advertisers?

I think the question also we want to raise is: can we separate the advertising from the e-mail and the UseNet conferences in particularly. We do in the real world — not with the e-mail. We do with advertising. You don't find advertising inserted in the middle of a news message. It's certainly alongside, so that one can scan it, but it's not mixed up in the middle.

The postal system, of course, is not a very good model for e-mail on the Internet since we have largely turned it over to junk mail, and that's what we're seeking to avoid on electronic mail. I think we can say no to ads in the e-mail on the Internet as an invasion of privacy, if we assert that as a strong and legitimate interest. I think we can also say no to ads in such things as UseNet groups and ListServes, and so forth, as a private group space. I mean, we have private conferences, we have all sorts of legitimate reasons why we have to have private communication for groups who have legitimate

needs, professional uses, and so forth, in which they do not want advertising messages cluttering up that system.

But in order to do this I think we have to also raise the question of where there is a public forum that meets the needs and purposes of the First Amendment. I think we don't really have a problem with the First Amendment in terms of the two suggestions that I've made of restricting ads in e-mail and UseNet conferences so long as there is an alternative on the Web. The Web provides a perfect way of everybody getting their ads on the systems.

Now, where are the controls? One can say first that it can happen with just self-restraint, as many of the advertisers that are going on the Internet are currently exercising self-restraint and being very cautious in terms of what they're doing to try to find what's acceptable, what works and what's useful. But self-restraint is not a terribly strong sanction, and certainly when there are individuals involved, the weight of the power is on the side of the large corporations, with very little weight on the side of the individuals to force the change. I think that a law prohibiting ads and e-mail would probably pass constitutional muster; or requiring the mail to be identified in such a manner that it could be filtered, but I doubt seriously that Congress is going to take much of an interest in this area for a while, since there are other things commanding their attention.

Now, the second line of defense, I think, really is network managers, and I think network managers — I mean, a lot of people say the Internet is uncontrollable, that it's a worldwide, global network of networks and there's no administrative center, no brain, no central system. But there are network managers, and most of them do, in fact, make rules, so there is nothing to stop network managers from establishing protocols or standards of what they consider appropriate behavior as a general rule across the board. There would always be some that would not comply, no doubt, but it certainly is at that level that the control can exist.

I think more likely the direction that we will go is in terms of providing the kind of data management techniques that put identifiers into the messages so that you can screen out things that are ads. I think this works equally well with obscene messages and with anonymous messages if people don't want to receive anonymous messages, so I think we're beginning to see the move in the direction of providing much more autonomy at the level of the individual user and making the software itself do the job for which it is certainly well-suited, in terms of giving us an opportunity to screen out what we do not wish to have enter our own information space.

What are the advantages of something like the Web? It seems to me that it's a marvelous opportunity to rethink how we want to organize our commercial activities, our public forum, our political lives. It's much less intrusive than any other manner of distributing information. It certainly saves network resources if you don't send thousands of messages into e-mail but permit people to go to the sites in which they're interested at the time that they want the advertising.

It is really a true marketplace to which people go when they want something. I buy a car about once every four years, and I don't read in the newspaper every day ads for automobiles, or in the junk mail something luring me to buy a new car. So it's much more efficient in terms of economic use of resources to provide something like the Web. But I think if we don't act now to establish the protocols of how we choose to manage advertising on the Web, we will be overwhelmed by advertisers dominating it, and we may lose the public space to which we've historically gone when we were interested in discussing public issues. I think this is an important First Amendment

principle that we should apply, not only in our own country, but urge others to follow our lead.

Thank you.

Wayne Martino: Thank you, Anne. Our last speaker today is going to be Tom Hemnes. Tom is a partner at Foley, Hoag & Eliot. He is going to speak on copyright and trademark issues.

Tom Hemnes: Thank you, Wayne. I'm going to make this perhaps [short], because I think we were to leave a little time available for question-and-answer at the end, so I'll go through some of these issues very quickly for you and then perhaps you'll have some questions. I'm going to do it in the reverse order of what was in your materials. First I'll talk about trademark issues and then copyright issues.

The first trademark issue, and probably the most important one for people who are involved with anything having to do with the Internet, has to do with domain names. The Trademark Act, the Landham Act, defines a trademark as being any word, symbol or device that is used to characterize the goods or services of a particular individual and distinguish them from those of others. There is no doubt as a matter of trademark law at all that domain names, at least in many instances, particularly when they are used by commercial entities that are operating on the Internet, would constitute service marks for purposes of the Landham Act. This immediately gets into an issue.

As all of you, I'm sure, are aware, domain names are assigned by InterNIC, and in fact they are assigned by Network Solutions acting under contract with the government. They have been assigned traditionally on a first come, first served basis, and actually that worked pretty well for quite a while when non-commercial interests dominated the Internet. With the coming of commercial interests though, all sorts of commercial problems have developed and they are exactly the same sorts of problems that one would expect in any area of trademark law.

First come, first served gets very complicated when you're dealing with commercial names because what "first" means traditionally on the Internet means the first use on the Internet. What it means as a matter of trademark or servicemark law is the first use to distinguish the goods or services from goods or services of others, and what that implies is that you can be awarded a domain name for use on the Internet which is identically the same as, for example, famous trademarks.

I'll give some examples of these that have been awarded so far. There is mcdonalds.com, ford.com, coke.com, hertz.com, mtv.com, nasdaq.com, esquire.com, gmc.com, eton.com. Each of those domain names has been awarded to somebody other than McDonald's Corporation, Ford Corporation, Coca-Cola Company, MTV, Hertz, etc. As you might imagine, this is not something that warms the hearts of McDonald's, MTV, Ford, Hertz and so forth; and the question arises: who wins? Is it the person who went through the appropriate procedures and got the name that they sought to get from InterNIC? Or, on the other hand, is it the person like Ford who has been using the mark in commerce for say 80 to 100 years, or Coca-Cola an even longer period of time? This has produced litigation, as you might imagine, and the litigation has, from a trademark lawyer's standpoint, a completely predictable outcome. The outcome is that whoever has the right in the mark arising from long and continuous use in commerce will have a right that trumps the right that is granted by someone like the person who approves Internet domain names.

This is something that's been established in an even more telling setting in connection with corporate names. You can play the same sort of game with corporate names. I checked recently and found that you can register a company called "Mustang Inc." in the state of Delaware. You can form a corporation and call it Mustang Inc. But if you used that corporation and started selling automobiles under it, or automobile accessories or anything having to do with automobiles, the Ford Motor Company would surely be able to sue you and they would be successful. So this has created something of a problem for Network Solutions and for the awarding of domain names. It's not all as easy as simply looking at the directory of the names that exist now for the Internet and deciding which of them ought to be approved, whether the name that you're seeking approval for is on the list or not. It is not realistic for Network Solutions to conduct what we would call a "trademark search" for a variety of reasons. One is it costs a lot of money and they don't have the budget to do it.

The other is that you can never reach certainty with a trademark search. You can acquire rights in a trademark in this country — not in all countries but in this country — you can acquire rights in a trademark simply by use, and for that reason there is no directory anywhere that you can consult that will tell you all of the previously awarded or previously used trademarks. The result is that Network Solutions has really no way to tell if the domain name that you're seeking to use infringes somebody's trademark. The result of that is they have had to get a lot more legalistic, I'm afraid, than they have been in the past, and what they will ask you to do now if you apply for a domain name is both indemnify them against claims that might be made by third parties for infringement and also post a bond against any such claims. This is something that is done obviously to protect them against being the defendant as they have been in lawsuits where it's alleged that by awarding a name like hertz.com or nasdaq.com and so forth, they have permitted the infringement of a third parties registered trademark.

What does this imply to you if you are representing, or if you are in fact an Internet provider or user? Well it implies that you have to think of domain names in a new way. You have to think of them not just as telephone numbers in effect, but you have to think of them as trademarks. You have to treat them as trademarks and you have to approach them from a trademark standpoint. This implies that what you need to do is to do what Network Solutions can't do, and that is to ask yourself whether you have rights to use the mark before you apply to obtain the domain name.

It's not that difficult to do. You do what's called "a full search." Most people do it through a company called [Thomson & Thomson]. A limited variety of the search can be performed on-line over the Dialog network, and it will provide information about registered trademarks. It's pretty good, although for the reasons that I described before, it's not 100% certain.

After you have determined that you know that a domain name is available for you as a trademark, the next thing that you ought to do is really twofold. First, you should apply in the ordinary way for the domain name, and I would recommend doing that as soon as possible, as soon as you think you might want to use it.

Second, I would strongly recommend applying for registration of the name as a trademark. You can do that under United States law and also under the laws of most foreign jurisdictions on the basis of what's called "intent to use" in the U.S. You don't have to have actually used the mark before you do this. If you have an intent to use it, for example, on the Internet, you can apply for federal registration based on that intent.

Another thing you need to know about the way Network Solutions is approaching these issues is that if you have a federal registration of a mark you can use that to block an application for somebody else's domain name. If you don't, on the other hand, the other person may be able to go ahead and get the name before you. So doing both things — both applying for federal registration of the mark and applying for the domain name — in my judgment is something that is highly advisable for anyone who is going to be doing business on the Net.

Let me give you some examples. This is not news. I mean, a lot of people have been doing this, and the materials which we'll provide have examples of a number of applications for registration of domain names. Examples are "life.com" for providing access to an electronic bulletin board in the field of insurance and financial consulting; "brides.com" for a general interest magazine on lifestyle; "parade.com" general interest magazine services, health and lifestyle information. Those are examples. Undoubtedly you would be able to think of your own name or mark. That's the basic advice.

Now let me get into a little bit more esoteric questions, but I think that they are probably coming down the pike pretty quickly.

We were just discussing the question of Web sites and there is an emerging body of law that protects what's known as "trade dress." There was a fairly well known Supreme Court case decided in the last few years, called the "Two Pesos" case, that basically expanded the basis on which you can claim protection as a trademark for the way — it's called trade dress — the way you dress your product, the way you present it to the public. In Two Pesos, it was the design of a restaurant and you can imagine the trade dress being something like the distinctive layout. I think that perhaps McDonald's, perhaps, isn't as distinctive as it needs to be. Two Pesos was a kind of southern-style or Mexican restaurant.

Fuddrucker's is one that I think probably has a protectable distinctive trade dress. Trade dress can attach to virtually anything that is a non-utilitarian feature of a product, and when you think of Web sites you have to assume that a lot of the presentation of information about a particular company that's presented on the pages of a Web site is likely to be protected as trade dress, and in my judgment should therefore be considering whether they ought not to be registering those designs as trade dress. It's something that they can probably protect as a matter of federal law and it's something they would want to protect, I would think, to prevent others from passing off their goods or trying to associate themselves with the provider of the Web site. That's the first pushing the law a little bit beyond where it's been so far.

The second is a problem that I wanted to mention — and I think that it's a problem that may not confront you today, but is highly likely to confront you in the not too distant future — and that's what is known generally in trademark law as "trademark depletion." There are currently — the last number I saw, and I'm sure the number is bigger now — there were 82,000-and-change domain names. That was a couple of months ago. I think the number by now is probably getting up closer to 90,000 or 100,000 domain names. The number of words in the English language that people use from day to day in ordinary discourse is a few thousand. The number of words in a really good dictionary is about 300,000; and a lot of those are things, by the way, as you might imagine you aren't likely to want to use as a domain name.

If there are 100,000 of them used up already and if a lot of the other few hundred thousand English words are likely to be unsuitable for domain names, you immediately see the problem. We're running out of them. A domain name by its nature consists of a word or a series of letters followed by .com. It does not have to be an

English word, you can expand it a bit beyond the range of English words by having non-English series of letters, but nevertheless there will come a time, I think in the fairly near future, when finding an available domain name will prove to be difficult.

There is a special problem with this that makes domain names a bit different from trademarks. The principle in trademark law is that two people can have identically the same trademark as long as they are using the trademark with different goods or services. A classic example is Cadillac automobiles and Cadillac dog food. No one thinks that General Motors makes dog food and nobody thinks that whoever it is that makes the dog food makes automobiles; therefore, they can both name their product Cadillac without infringing the rights of the other. In the context of domain names there is a problem, though, which is that you can only have one instance of a domain name; you cannot have multiple instances.

So if you take the example Cadillac, let's suppose you wanted to have a domain name "cadillac.com." Either the General Motors company or the dog food company is going to get it but not both, and this means that the range of names that are available for use on the Net is necessarily going to be, in effect, smaller than it is for trademarks, which means the problem of finding an available name will be in many cases more acute.

To me this simply re-emphasizes the importance for people who are beginning to do commerce over the Net of worrying over this issue now and at least get them before they're gone — in terms of domain names — because the ones that will be available in the future are going to become more and more unusual, further removed from ordinary English and probably less desirable as trademarks because their association with your company, or with the product that you produce, will become more and more remote.

A couple of final comments on trademarks. One is that I mentioned [Thomson & Thomson]; I don't mean to be giving an ad to them, but they really dominate the field, though. They are beginning to provide, as part of what are called "full searches," searches of domain names, so you can find out if a domain name is available by calling [Thomson & Thomson] as well as under the traditional means.

Second, and this issue has to do with trademark infringement, there's a concept of "tarnishment" in trademark law that says that if someone else uses your mark in a way that may disparage your company or your product, you will have an action against them. Well, these principles apply to domain names as well as to other areas of commerce, and therefore, before you get too tricky with your trademarks you'll want to question whether you are possibly infringing the rights of someone else.

The best example I know of this was a domain name that you may have heard of which was "kaplan.sucks@review.com" which was taken out by Princeton Review, Inc. This is the review courses for MCAT and law boards and what not. This was objected to by Kaplan on the ground of disparagement, probably successfully. In any case in which you try to do — as Anne mentioned before — comparative advertising, not only compare your product with others but disparage the other's product, you're subject to that.

That's it on trademark. Let me say a few things about copyright. I guess what I'd say generally is that you ought to think of Internet as a copyright infringement machine. It's whole purpose is to take information, make copies of it and distribute them. When you get your materials you'll see that I've reproduced the very rudiments of copyright law, including what is protected as a copyrighted work and also the exclusive rights that copyright provides to the owner of the copyrighted work. I'll read down the list to you very quickly. Most people know this sort of thing intuitively.

Copyright protects literary works, musical works, dramatic works — that probably doesn't apply — pictorial, graphic and sculptural works, motion pictures and other audio-visual works, sound recordings and others, architectural works. Well, a lot of things are the things that are going out over the Net. Literary works, among other things, includes not only text but also computer software programs. Musical works, pictorial, graphic and sculptural works — those are all the things you're going to find either on the Net or on the WorldWide Web. They all under U.S. law and under the laws of virtually every other jurisdiction protected by copyright automatically without any need to put a notice on them, without any need to register the copyright. The protection arises by dint of their creation.

What are the exclusive rights that the owner of copyright has in these things? Well, they are the rights that you might imagine. The first is the right to reproduce the copyrighted work in copies or phono records. Second, to prepare derivative works may or may not apply, the first certainly does. Third, the right to distribute copies of the copyrighted work to the public by sale or other transfer of ownership or by rental, lease or lending. Fourth, the right to display the work publicly. Fifth, the right to perform the work. Sixth, the right to perform the work publicly.

Well, when you think of what goes on over the Internet, virtually everything involves taking, at a minimum, a literary work — something that's written out in some language — and making it available for distribution in copies to anybody who logs onto the Net.

There may be some variations in the way this works out. If you take an e-mail document and you attach something to it, you attach another document to e-mail and then you send it to someone, there is no doubt in my judgment whatsoever that you have made a copy of the document attached and you have distributed it. You may not have distributed it publicly as long as you send it to only one person. If you send it to enough people, though, that would be considered a public distribution. That would be considered, I think, beyond any question an infringement of the exclusive right of the owner of copyright — the document you attached to your e-mail.

Similarly, if you take a photograph — there was the famous *Playboy* case involving photographs out of *Playboy* — if you take a photograph which is a pictorial work protected by copyright and you distribute it over the Net, you will be infringing the copyright held by the author or assignee of the author of that copyrighted work.

The issue gets a little bit more tricky if you deal with issues like bulletin boards. If you don't yourself distribute something over a bulletin board but simply make it available for others to download, then there's an argument at least that you have not yourself distributed the work publicly. On the other hand, there is very likely to be a copy of the work created at least in a server to make it available for distribution over the Net and that copy of the work, unless it is authorized by the owner, would be enough in most cases to establish a case for copyright infringement. Furthermore, the fact that you posted on a bulletin board to make it available for distribution would, I think, lead to a strong argument for what's called contributory infringement even if you aren't liable for direct infringement.

The moral of these comments is that the copyright law is something that you need to have on your mind when you are working in the Internet environment all the time and the default setting for people who are involved in Internet activity should be — don't do it.

I'm sorry to say that this is as clear as that, but the copyright law is rather vivid on these points. If you didn't create it yourself, if your company didn't create it, if it

came from somewhere else, the odds are that what you want to do with it over the Net at least arguably creates liability under the copyright act. This means that you have to find where you can appropriate licensing authorities to do what you want to do. In many cases people will be happy to give you a license. In some cases, on the other hand, they may not and they could object.

As an example, it's something that we had to worry about in connection with the presentation today because the materials we are providing are, I believe, going to be provided at a Web site. What guys like me usually do with presentations like this is run off and xerox a bunch of *Law Review* articles and whatnot and make them available for the people who attend the seminar. Usually you can; it may be a fair use, it may be a violation. Usually the assumption is that you can get away with that with a limited number of people at a law seminar.

But when you think about posting one of these things at a Web site, you really are multiplying the problem by many thousandfold and therefore you're multiplying the risk that someone might object by many thousandfold and it's something to which you need to give care and attention.

I'll quickly mention two more things. One, vicarious liability for the person who provides the network service, and by that I mean a server. This is an area of the law that I think will need to be developed. I think in many cases it may depend on the extent to which the person acts like a publisher on the one hand, or like a common carrier on the other hand. A publisher traditionally is liable for the content of the publication. If you publish a book and the book infringes somebody's copyright, even if you didn't write the book, even if you didn't know that it was an infringement, you can be liable. On the other hand, if someone recites a copyrighted work over the telephone, the telephone company is not liable for an infringement of the work, and I think that will be the battleground.

There's more, but I'll stop there. Maybe you have questions. Thank you.

Wayne Martino: We've run over a little bit. I think people are going to stay around for a question and answer period. Does anybody have any questions?

W: I'm curious what the panelists think about any kind of lack of understanding of the technology by legislators [inaudible]. How does that impact what's going on right now?

Wayne Martino: The question is, what is the lack of understanding of technology and the impact of that on legislators and lawyers? I think it's absolutely incredible. I think most lawyers are not computer literate, judges are not computer literate and they don't understand the context of the technology.

Lance Rose: It's a changing thing. I've been doing computer law for 15 years and judges have always had to have that stuff explained to them. Did Ken mention the Stephen Jackson Games case? Did he mention that the trial counsel actually brought a computer in and showed the judge what a bulletin board looks like? He didn't mention that part?

Wayne Martino: I don't know if he mentioned that.

Lance Rose: Because that's kind of what you need. I was talking with somebody about this the other day. In fact this law firm I just joined, this big law firm in Phoenix, it's like, "how are we going to get the other lawyers there Net-savvy? How are we going to tell

them how it works?" I said we've got to bring a laptop in and show these guys. There's a distance.

It's like asking a judge to adjudicate things that are going on in Mars. Legislators love it. You know the Exon Amendment? Exon has been going around with his little blue book, apparently full of pictures trying to get this thing — which was passed — trying to get as much of it actually into the reconciled bill as possible, and he's been telling the other Senators, "click, click, click, and there it is." Pornography, bestiality, bondage, anything you want. Of course, these guys are all thinking about their political hides, but there's this new layer of mystification on top of it which makes the politicians not only afraid for their hides, but not quite sure what's going to bite them. So it makes it really a very kind of crazy area of regulation right now.

W: I have a question for the last presenter that you had — kind of a two-part question. In terms of say a company that has a logo, for example, that they have — I don't know if the correct word is trademark or copyrighted — with the degree with which it could go from the Internet and Web pages now, I know there is some responsibility on the part of the owner of that image to police its usage in the world at large. So how does that apply to people using it, for example now, on the WorldWide Web? What is the image owner's responsibility to actively go out and search for that being used on the Web?

And then, the second part of the question would be: if you have something like an Internet service provider that has discussion groups, and they set up a discussion group that pertains to that particular product, [inaudible] what is the degree of their right to, sort of, sell their service using this feature as part of what they advertise that they offer? And do they have a responsibility to clear that with the company whose service [inaudible]?

Tom Hemnes: Your first question, I think, is whether you have a responsibility to police the use of the logo and in particular go out and actively search out people who may be infringing. The usual rule is that the owner of a trademark does not have a responsibility to go out and ferret out every infringement. On the other hand, if you become aware of infringements and don't do anything about them, there are a couple of problems that you can encounter. One problem is that the people that you become aware of may acquire a defense either of acquiescence saying that you knew about it and you delayed in asserting rights and in reliance on that they continued to use the mark.

The second problem is that if you in fact don't police the mark effectively, although there isn't an obligation to, but if you don't police it, then the mark comes to be widely known as denoting a particular type of service or particular type of good as opposed to your good or service. You can encounter a problem of "genericness." An example of that is that there are famous companies — Coca-Cola actually has what they call "the Coke police" who go around and march up to a counter and say, "I'd like to have one of them Cokes," and if the restaurant is serving Pepsi, they'll get sued and the reason is they don't want Coke to become a generic term for a cola soft drink. So I think that was your first question.

Your second question has to do with a couple of related issues. Let's assume, hypothetically, that you had a discussion group pertaining to some trademark product. There would be, at least in this country, a perfect right to refer to the product using the trademarked name which would be considered a fair use of the trademark. I mean, what else are you going to call it if you don't call it a Corvette or whatever? Second, you

asked the extent to which you can use the other person's trademark to sell your own product. Is that right?

W: If there's an on-line service that features these kinds of discussion groups and they use it to attract [inaudible].

Tom Hemnes: I would think that if you were *Consumer Reports* and you said, "We're going to have an on-line service to talk about automobiles and the ones we're going to talk about this month are Chevys, Fords and Chryslers," I think that would be fine. On the other hand, if you were doing it in a way that conveyed a sense that you were sponsored, or affiliated with, or associated with the proprietor of the trademark, you probably would have crossed the line into an infringement. Is that helpful?

W: Thank you.

Wayne Martino: Next question.

M: If I get a press kit including promotional material from a commercial operator and it includes logos for a nationally manufactured product which they have the right to distribute as a retail outlet of that, say, Amana or something as an example, and they distribute this in a press kit and without their knowledge I put that on a Web site, what are the — if any — legal implications of that?

Kenneth Rosenthal: What are you doing at the Web site? What's the purpose of the use?

M: Let's just say that the Web site was going to put a whole bunch of commercial information available so the users can come look at it at no charge to either the displayer or the user looking at it.

Kenneth Rosenthal: Hard case. This is just an [inaudible], I mean, you're just being a nice...

M: This is true. It actually happened.

Kenneth Rosenthal: It's a public service that's being provided in effect?

M: Well it is, except that the intent for this site is to sell advertising on it once they get in the pits and become a demand [inaudible].

Kenneth Rosenthal: If they're selling advertising on it then I think that the people whose marks appear would have a claim. On the other hand if it's simply informational I would think that they probably would be able to get away with it. Does that sound right?

Lance Rose: Well, legally. But if it's a real situation, first of all you're republishing other people's published materials. That's the first [inaudible] you've got to be concerned about, not the logos included.

M: Even the press kit?

Lance Rose: The first thing you're doing is reproducing something you got from somebody else. You're republishing, and you've got to think about the copyrights and whatever rights they have before you about the logos on their stuff. First, that's number one.

We're really into motivations. We're really into who is bothered about this. Somebody who is selling a product whose mark is being re-propagated in another form that they didn't have to pay for, and let's assume you're not running a porno site, is going to love it. It's going to be very, very unlikely — not impossible, but you're looking at low level risk. I'm not giving you specific legal advice, but you are looking at a low level of risk for people whose brand names you are propagating in a way that they don't have to pay for it. They're getting extra mileage for their buck.

The people that might be bothered are the people whose stuff you're republishing without their permission. They're not controlling the publishing medium anymore. There's another practical thing. Anybody comes to you about it, this is very standard infringement stuff. The fastest way to knock the legs out of an infringement claim is to say, "Okay, I'll stop." The primary remedy in an infringement claim is an injunction. "Okay, I'll stop." What are they going to sue you for, money? What money are they going to show you made out of that?

One mark out of, say, thousands displayed and you made a few thousand bucks that month, what are they suing for, a dollar? They're suing you for a dollar, maybe. So these are the practicalities if you're in a real situation. These are the practicalities that you look at on top of the legal analysis.

M: So your advice would be to have some kind of release even [inaudible].

Lance Rose: My advice? I'd have to find out a lot more about what you're doing.

M: I'm not doing it but I'm aware of a publisher doing it. They have asked if they should get permission from these people to do this.

Lance Rose: The logo people? If it was me, I'm not telling anybody else to do this, I wouldn't be that concerned about the logo people if I was running a fairly reputable-looking Web site. It doesn't mean I wouldn't look in to the property issues, but my first level of inquiry would be, what are these materials that I'm receiving in my hands that I'm reproducing? That's the publications that you're most directly reproducing, first level of contact.

M: Second question. If you spent thousands of dollars scanning this information in and created a site that had 4,000 pages on it of all these materials that you had been provided, and a competitor of yours downloaded that and put up a competitive site using that material, what rights do you have if they haven't altered it, and then what rights to you have if they have altered it, put their own borders around the pictures and so forth?

Tom Hemnes: If you have compiled a — and let's suppose hypothetically that one way or the other you had a right to do it — compiled thousands of pages of things that are available in other places but are never collected in one place, that compilation is a separate, copyrightable work in which you could claim ownership. If somebody else

copies the whole compilation, they would be infringing your copyright in the compilation. I think that's the short answer.

W: [inaudible]

Wayne Martino: The question is: What are the international aspects of trademark and copyright infringement?

Lance Rose: First of all, what's the likelihood that if you're infringing someone's rights in another country they're going to haul you into court in that country? And that depends on what type of organization you're with.

The fact is that trademark rights are national. They're even, within this country, state by state in a sense, but they're national, so there actually are dozens or hundreds — for certain brand names — of perfectly legal claimants to a given trademark on-line. This is apart from the domain name issue, whether you're using a domain name in some other way. Bosco - I don't know what the rights are to Bosco around the world. Maybe they're all owned by one company, maybe there are a lot of companies that own them. Maybe it's legal here but not legal in Spain, hypothetically. Maybe it's legal here and not legal in France or Lithuania or Germany or something, and this is absolutely not touched yet.

This is something that, from the lawyers I know, nobody has worked out. This is craziness. We have a globe-spanning Internet and we have a bunch of national-based trademark right regimes and these have not been reconciled in any fashion, and even the theories about how to reconcile them are just starting to be thought about, at least in my experience.

Tom Hemnes: I might make a few additional comments. The domain names that are available in Europe and in the Far East are awarded by different entities than in the U.S. If you want them, I have the e-mail addresses if you like. You can get a domain name there. So, it would be — if you are serious about it — it would be very advisable to seek to acquire the domain name under the aegis of those organizations as well as under the Network Solutions organization in the U.S.

The second is — and this is where I'm not sure what the answer is — but in principle marks that you can register in the U.S. are frequently registrable abroad as was indicated on a country by country basis. There are some exceptions. There are some international regimes to which the U.S., unfortunately, is not a party that would make it a little bit easier to do it; but basically, as a U.S. resident, you're going to have to do it country by country.

In most countries you can do it, though, in anticipation of use, so if you have a desirable domain name, you can try to register it abroad. There will be some issues. There are description problems in other countries that you frequently don't have here. Some countries make it more difficult to register service marks than in the U.S., but in principle you can register them abroad, I believe.

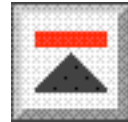
M: In the discussion in the Internet industry upstairs this morning as well as some of the other discussions I have heard, there is an argument being proposed that the Internet is a public medium and people knowingly put this information that they have copyrighted onto this media and therefore you should essentially transfer the copyright ...[inaudible].

Tom Hemnes: Let's take the case where you are clearly the owner of the copyright in say a literary work, an image text or a computer software program that you post on the Net. I think that if somebody took it down off a bulletin board for example, they would have a pretty strong argument that in posting it there you had, unless you indicated to the contrary, you had by implication granted a non-exclusive license to them to download it; and that may be what they were talking about. I would consider that to be a fairly compelling argument.

Wayne Martino: I think you'll find out in a second, because Lance is biting his lip here, that some people may have a different view on that.

Tom Hemnes: What I was going to say, though, is that you... I think that maybe this is what Lance is about to say — it seems to me that you can negate that argument by giving notices of what your claims are when you post it on the Net. In other words, if you say we are not by, you know, maybe you make a demonstration model available, that you are not by doing that, by implication, granting a license for any other use. I think that might help.

INTERNET LEGAL LIABILITY OF SYSTEM OPERATORS



MODERATOR

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SPEAKERS

Lance Rose, Esq.
Partner, Lewis & Roca
Ken Rosenthal, Esq.
Brenner, Saltzman & Wallman

Wayne Martino: I think we are ready to start. This is [a session about] the liability of systems operators. Lance Rose, who will be speaking first, is a partner at Lewis & Roca in Phoenix. He co-chairs their intellectual property department, and Lance has been writing about this area for a long time, including writing one of the first books on this called *SysLaw*. He also has a book called *NetLaw*. Is that a successor to *SysLaw*?

Lance Rose: Yes.

Wayne Martino: I highly recommend both of them. The second speaker will be Ken Rosenthal from Brenner, Saltzman & Wallman in New Haven. He will be speaking about criminal issues, and specifically about how to respond to subpoenas. At this point I'm going to turn it over to Lance Rose.

Lance Rose: Hi. This session, I believe, is called "Liability of System Operators," so that is what I would like to address. It kind of leads to the question, "What is a system operator?" A system operator is [also called] a "sysop," and you may hear me use that term a fair amount. I think that's kind of how "Webcentric" and Web-oriented things have become, where the concept of gets lost in the wash sometimes.

Now, what is a sysop? What is a system operator? Is a system operator someone who runs an advertising site or a billboard on the Web? I don't really think so; that's somebody running some advertising. Is it a Web publisher on today's Web? Is a sysop somebody who is running a "Cool Site of the Day," or something chock full of interesting information for people to point at and click around? Again, probably not, not really. Is a sysop one of the legions of upcoming people who offer on-line shopping services? We're all waiting to become law firms of on-line shopping services as soon as those secure digital payments are under control. I don't really think a sysop is one of those people, either. They may be on-line store proprietors, but not a system operator in the way that term has been used.

A sysop is probably, more properly, someone who offers group interactive services. There is actually quite a lot of tradition, going back to the 70's — at least the 70's, maybe the 60's, but probably the 70's — of people running computerized communication systems where they moderate discussions or in some sense sustain a support discussion among groups of people. They're sometimes referred to as "threaded discussions," or "conferencing," and I think we will see sysops coming to the Web more rapidly if the deal that was announced between Netscape and a company called Calabria comes to fruition. Calabria, as I saw in news reports, was referred to as "the creator of software that allows threaded discussions and conferencing," the two things conspicuously absent from Netscape up until now.

There are bulletin boards. There were bulletin boards since the mid-70's, since Ward Christensen's first bulletin board, and those have always been group discussion areas.

Large on-line servers have been around for a long time, with CompuServe, Prodigy, The Source before that, and America Online and others coming up.

NewsNet is the place for newsgroups, and those are all discussions with bunches of people yakking about stuff.

There are mailing lists. How many people here are on mailing lists, Internet mailing lists? Pretty good, about half. Mailing lists are pretty cool. It's a conference in your mail box, and those, of course, are group discussions once more, kind of do-it-yourself, roll-your-own-group discussions that are often impromptu and also often long-lasting, going over months or years.

There are real-time "Chat" type areas — I guess it's still called chat, I don't know what else it might be called. There are sometimes people who monitor those areas, and they've got to be pretty light on their feet to get anything accomplished other than shutting people out when they don't like the way they're behaving.

There is a lot of interactive stuff out there. You're not going to see a lot of it on the Web, but there is a lot and the Web is moving in that direction.

Oh, another one I forgot to mention was MUDs and MOOs. Here's a good one: how many people here have been on a MUD or a MOO? That's pretty cool — more than zero. Obviously a lot of people do go to them, but most of them are kind of sitting at the terminal in the college dorm right now instead of attending a conference like this. For those of you who aren't familiar with MUDs and MOOs, those are virtual reality environments, group-interactive virtual reality environments which right now are mostly text-supported. They're mostly text descriptions of what people look like and what they do, what they're doing, what kind of places you're in and where you're going. It's kind of multi-person interactive "Zork," although it's heading in the direction of graphical virtual reality in the not too distant future with things like VRML — Virtual Reality Modeling Language — and applications like Worlds, Inc., which I believe has one in *Virtual Vegas*. There's a lot of virtualized visual environments that are coming up, all very highly interactive.

And there's also this real-time chat function; you might consider a chat monitor person as a sysop, but usually those people aren't really the sysops.

Usually the sysops, the system operators, are the people who manage the slow-motion discussions that happen in conferencing areas. Somebody posts a thought — "posting" is the typical verb used — somebody uploads or posts the message, says something, and somebody else responds to it in an active bulletin board-type setting. [The response] could be within a few minutes; in a relatively inactive one it could be half a day or a day later. Everybody who logs into this area will see that stuff, and it doesn't take long for those of us — and I imagine it's most of us at this point — who would see such discussions to understand them as discussions and to understand it as a bunch of people interacting.

I'm sure you're all aware of the standard ratio of people who verbally interact to the ones who are just standing around, logging on and looking, and who are known as "lurkers." There's usually about an 8-to-1 to 10-to-1 lurker to active participant ratio, so every time it looks like you've got 30 people having a discussion it's more like 250 or 300 people being directly aware of that discussion.

You know, I have talked about these big legal issues so much over the years, what I want to do now is kind of give a framework; then we'll have a question and answer session after I and Ken finish speaking, and if you have more particular questions we can get into it then.

The big issues for system operator liability could be put a number of different ways, so I'm going to just put it one way and hope it will make sense. One issue for somebody who runs an on-line system where people are interacting is whether they have to monitor everything on

the system. Do they have to look at everything going through the system? Is there some kind of legal responsibility for that? If not everything, if you don't have to monitor everything, do you have to monitor anything? If you have to monitor anything, what is it that you have to monitor? These questions are all out there right now, and aside from what messages and types of files you might have to monitor, what are you looking for? Are you looking for things that are illegal? Are you looking just for copyright infringements? Are you looking for defamation? Are you looking for people illegally exporting encryption software? Are you looking for people posting credit card numbers? Are you looking for images from magazines? Are you looking for pornography, obscenity? What are you looking for? And, of course, aside from what they're looking for, what system operators really care about is none of that, of course. What system operators care about is the bozo who blunders into an on-line conference and screws it up and drives everybody out. If it's a paying board, the person who does that makes them lose business.

Those are the ones they're really on the lookout for, and that's what they're monitoring for. Not that they don't care that people get ripped off, but that's not what's most germane to their business. What's most germane to their business is having a place where people are interacting in a way that they feel promotes what they're trying to do, either commercially or noncommercially.

So we have this interesting thing where, of course, most system operators are looking but they're really not trying to protect the rest of the world from itself. They're trying to make their own business run smoothly. It's like if we had a monitor here in this conference room. The monitor isn't really looking to see if somebody's infringing copyrights; they're looking to see if anybody is getting up and attacking the other people in the room, because it makes it unpleasant and everybody's going to leave and they want to keep the session going. That's what the system operator really has their eye on, and the legal stuff is kind of an impingement from the outside.

Aside from monitoring, the other big question, of course, is that once the system operator knows there's something on the system — hey, there's a copyright infringement, and they hear this from a reliable person — what are they supposed to do about it?

“Okay, thanks, you told me. I'm a distributor, I don't care.”

Or, “Oh, a copyright infringement? Maybe I ought to look at that.”

Or, “A copyright infringement? Maybe I ought to take it off the system, and then if anybody complains about having taken it off the system maybe I'll put it back on again.”

There's a whole question about what the proper conduct is. There's also a whole question about what knowledge is. If some “boy who cried wolf” person tells you that there's illegal stuff — what if somebody says, “your bulletin board, your conferencing area is full of copyright infringements, check it out.” As a system operator, have you now been placed under a duty to check it out because somebody says it's full of copyright infringements? I would be tempted to wonder how credible that kind of comment is. I might e-mail back to the person, “please be a little more specific. Which files? Where? And tell me why they're infringements.” But these are still questions that are being asked.

There have been a few cases and they give, maybe, beginnings of guidance. One case is [Cubby] vs. CompuServe. It happened in the beginning of this decade, in the Federal Court in the Southern District of New York. CompuServe was carrying an electronic newsletter called *Rumorville* — no, I don't know if CompuServe was carrying *Rumorville* — but there was an electronic newsletter called *Rumorville*, and CompuServe was carrying another electronic newsletter which I believe was called *Scuttlebutt*. *Scuttlebutt* was the new kid on the block — wait, let me back up off of that. These aspects of the facts are not that important, but I don't want to get it wrong.

There were two electronic “rumor” newsletters, and one of them said bad things about the other just like gossip sheets will do. They say bad things about other people; one of them said bad things about the other. The one that had the bad things said about it went after the electronic newsletter where the bad things were said and also after CompuServe as the carrier of the electronic newsletter. They said, “you carried it, you’re responsible for it.”

CompuServe said, “we didn’t know about this stuff. There’s a lot of stuff going through our system. We have a person managing that area of CompuServe. That person managing that area of CompuServe has a contract with these people that do the electronic newsletter. If you’re going to bother anybody, go bother them. We don’t have anything to do with it.”

They actually made a motion to the judge, essentially saying, “we had nothing to do with this. Let us out of this case. We did not put the materials in this newsletter together; we don’t know if it’s a defamation or not, and we don’t care, we’re just the distributor.” The judge went with it. He said, “that’s fine, you’re out.”

CompuServe distributes a lot of information, and the judge felt this is an important function, this is a First Amendment speech function, this is part of the freedom of the press in this country and CompuServe is kind of an essential channel for freedom of the press. Freedom of the press is not real useful if the words could be stopped on the way out of your mouth, if you could say anything you want but they got blocked before they got to the speaker. CompuServe is one of these conduits through which words get to the speaker. The court made analogies to bookstores and to magazine distributors as similarly protected.

If they don’t know about the stuff they’re distributing then they can’t be bothered by a lot of legal burdens, because if you make CompuServe, for instance, start to monitor for all the defamatory information on the system, that’s a hardship. There’s a whole lot of non-defamatory information. In fact, that’s quite the bulk of it; that might be 99.9% of it, and that’s perfectly legal information.

[In the Stratton Oakmont vs. Prodigy case], the fact that this anonymous person who said these bad things about Stratton Oakmont was using an account that had belonged to a Prodigy employee who left the company, where the account was never retired and somebody found a way to use that account without being identified — it kind of looked like Prodigy did something wrong there. Why were these accounts left hanging so that people could jump into [them] and anonymously leave bad messages? It doesn’t really stand up under a close analysis that Prodigy should get into any trouble particularly for that, but it just made them look sloppy and more open to having some kind of responsibility pinned on them.

Prodigy also mentioned, when this motion on this decision came up, that it had stopped monitoring a year or two before the messages in question occurred; but the judge seemed to feel that didn’t make a difference. The judge seemed to feel that whether or not Prodigy monitored, what was more important was that they were telling the public that this was a safe place, and they had taken some obligation to keep it safe and see that all the messages were safe. So we had this decision and it drove everybody in the on-line services industry kind of crazy. And then a funny thing happened.

Prodigy fired its lawyers and hired another lawyer, somebody with a reputation for First Amendment work — entertainment lawyers, but with a reputation for some First Amendment savvy. The first thing they did was move to re-argue that same motion, saying that was just a preliminary motion. The judge said that Prodigy is a publisher and not a distributor, so they’re not just going to slip out of the case the way CompuServe did. Prodigy said, “we’re going to reargue that motion. We’re going to try to convince you, judge, that we really are a distributor and [that you should] just let us out of this case now.” It’s not very usual, but it happens every now and then in litigation.

When this opportunity came up, a lot of industry groups now saw a chance to jump in and try to reverse this shocking result which the judge had come to, and some pretty compelling briefs were filed on behalf of chunks of large companies. This was just a lot of action. And then a very funny thing happened, I think last week. Stratton Oakmont, the plaintiff, gave up on the motion to re-argue.

They already had the motion in their favor saying that Prodigy was a publisher, and when they gave up arguing against a re-argument, and in a sense they handed the motion to Prodigy. It was kind of reversing the result, [with a new result] that Prodigy would be considered a distributor again. There was also a public statement from Prodigy saying they were sorry if Stratton Oakmont got hurt from the bad things that were said about it on Prodigy. Stratton Oakmont lawyers said, "We got what we wanted; Prodigy admitted responsibility." Prodigy's lawyers said, "We did no such thing, we just said we were sorry if they got hurt." That's nice room for posturing there.

Supposedly, we now have this decision on the books that says that Prodigy was a publisher. Apparently, now Stratton Oakmont is going to work with Prodigy to try to get the judge to vacate that earlier ruling, so it's not in any sense out there as law for other companies to rely on in going after on-line services.

How did this come about? How did this interesting thing happen? This is just something that comes out of the particulars of the case. Stratton Oakmont, this company that had the bad things said about it, has been under a cloud with the Securities and Exchange Commission. The question really wasn't, "Is this a suspicious outfit?" The question was, "Which things that are being said about them are true?" When Prodigy hired its new lawyer they made it clear that what they were going to do was vigorously pursue the truth as a defense to libel. There is really no way of knowing if the statements that Stratton Oakmont were suing about were true or not, unless you do discovery and find out everything about Stratton Oakmont.

As a company under a cloud with the SEC and the securities regulators, what they were facing was the prospect of very extensive discovery and the possibility of going into the public record with everything they'd been doing for the past few years, and it looks like this was the basis on which this whole thing has kind of unraveled. That's kind of an example how off the issue these things can end up being decided on. Those are kind of the two cases that have come closest to saying anything about this issue. I'll mention briefly some other things.

There have been some cases in the copyright area that are related to this. One was called *Playboy vs. [Freina]*, down in Georgia. There was a bulletin board there that had pictures from Playboy going through the system. The pictures from Playboy even had ads for the bulletin board imprinted on the picture — if you looked at a picture on your viewer, it would have the name of the bulletin board, Text Warehouse, in the bottom of the picture. Nonetheless, the bulletin board operator said he didn't know these pictures were on the system.

Playboy moved for summary judgment on the issue of copyright infringement. They said, "Look judge, all these pictures taken from our magazine are there, they're on the system, just give us summary judgment. It's absolute liability for distributors." The person who ran the system said, "I didn't know about it." Even though it was kind of clear he did, he said, "I didn't know about it." When the judge was faced with the summary judgment motion, when the guy says, "I don't know about it," he actually has to give some credit to that, even if it seems on the facts that this is kind of a ridiculous statement. This led the judge to say something that, again, drove the on-line system lawyers kind of crazy. He said, "it's irrelevant whether the system operator knows or doesn't know about the copyright infringement on the system. They're going to be liable for it."

In that posture, it was a clear copyright infringement. It was kind of obvious the guy knew about it, but it hadn't been proven as far you will go in a court of law. The judge just

wanted to get this thing off his office docket, and so he made this statement, "it's not relevant if you know there's a copyright infringement or not on your system. You can be liable for it if it's there."

My personal view is that this case is not going to be widely followed, because it's just a little too wacky; but it causes a lot of concern because it's reported in the law books, and these are the things that lawyers use as precedent when they're arguing new cases.

Something also happened the other way, and it seemed that copyright was starting to come out as a separate area from cases involving defamation or obscenity or other things. It seemed that somehow in copyright, like in cases of defamation or obscenity, if a distributor says they don't know that something's there, that's a defense. If they do know something's there then they have to do something about it; but if they don't know, it's a defense. It was starting to develop in copyright that even if you don't know something's there you could be liable, so now we have different kinds of rules for different kinds of illegal materials.

Now there's an ongoing case in California involving the Church of Scientology. There's a couple of cases, but I'm not going to get into the whole mess. The Church of Scientology seems to do legal actions in bunches, and there's other interesting things we won't get into unless you want to talk about it later. But there's this one case where they've been going after somebody who left the Church 12 or 13 years ago. He was a fairly high-level fellow and he's been fighting with them ever since. In his fight, what he started doing over the last few years was putting materials onto the Internet that were supposedly these sacred, copyrighted or secret Church materials, and so [the Church] went for an injunction in California Federal Court.

Now, they went for an injunction not only against this guy that they've been locked in this fight with for years, who was now pulling the Internet stunt on them, but also against the bulletin board that he was posting to and the Internet service provider that the bulletin board was getting to the Internet through. The Internet service provider was NETCOM. I forget the name of the bulletin board, but the Church of Scientology was suing all of them and asking the court to put an injunction against all of them so that the service provider and the bulletin board would have a legal obligation to keep things that were infringing on the Church's copyright from going out on the Internet.

There was a very early order when the case started up — the judge didn't know what was going on, and he kind of granted it for a few days against all the parties — that said they all have to not do it; but when it was re-argued a week or two later, and the Internet service provider and the bulletin board had a chance to say, "We're just distributors here," that distributor thing comes up again. The judge did make a distinction. He said that this guy, Dennis Erlich, can't post things that infringe on the Church's copyright. He has to know what's he's doing, and he can't do it. He might get away with some fair use, if he can show us what fair use is, but he basically can't infringe the Church's copyright.

The judge also said that he was not going to make any orders affecting the bulletin board or the Internet service provider. It's not their job to monitor what this other character does; the real fight is between the Church of Scientology and this guy. If there are identified materials that they're told to take off then fine, but they're not going to be put under a general monitoring obligation because one guy is supposedly putting copyright-infringing materials through the system.

The judge had mentioned the First Amendment in making this order, and again we're getting to a freedom of speech issue. The distributor is going to get in the same kind of trouble as the person, the individual, or the company that might be putting out the troublesome materials. That case is still going on, and it could turn again the other way, I suppose, depending on what is shown; but it is at least going in the other direction from the Playboy case which said that this thing that was very bothersome to on-line services.

By the way, it's very nice for property owners. There are two camps here; I guess I'm speaking on behalf of the on-line services a little bit, but for every on-line service that's annoyed by this there's a group like ASCAP or Paramount or somebody that loves it. [These groups feel that] everybody is supposed to go out and protect their property for them; and the on-line services say, "we're not in business to protect your property, we're in business to distribute information." That's kind of the field of play there.

There's another case going on right now in the Southern District of New York Federal Court, Manhattan, in the same courthouse — but not the same judge — where the [Cubby] versus CompuServe case happened. Over 100 music publishers are suing CompuServe because CompuServe users transferred some music files among themselves through the CompuServe system. CompuServe again says it doesn't know that they were doing this. The music publishers say CompuServe is liable for copyright infringement, and that one is still working its way through.

The most recent thing, I guess, is the famous White Paper on Copyright from the National Information Infrastructure Task Force on Copyright, which interestingly does not include the Copyright Office as one of the institutions involved in putting it out. It's more like it's coming from the Patent Office; I'm not sure why that all worked out that way, but it does. It suggests that on-line services should be held liable in some fashion for copyright infringements on the service. This is just a suggestion, and there's going to be quite a storm about this. Some senator, I think, very recently proposed a bill that would basically put into legislation everything proposed in the White Paper, so we're going to see some interesting fighting over that.

[There's also] other legislation attempting to impose obligations on system operators, and we're just going to mention this briefly. There's pornography legislation — I'm not going to get into it in detail at the moment — but there's a bunch of adult material legislation pending that's actually been voted in, but the final form of it has to be worked out by Congress. This may impose a lot of obligations on providers or on-line services, or it may be very light; that really depends on what these Congress people and lobbyists and politicians and whatever work out among themselves.

There was some anti-"bomb information" legislation introduced by Senator Feinstein a few months ago. After the Oklahoma City bombing — the fertilizer bombing involving a couple of farm boys or something — there were Internet terrorism hearings a couple weeks later, and these were apparently stimulated by this bombing. Distribution of bomb-making information on the Internet was the evil to be addressed. Even though this was not what was turning out to have happened in Oklahoma City, it seemed the pertinent place to bring this kind of subject up. There is some potential legislation that would put some type of obligation on on-line service providers to be careful about bomb information; if they have some idea it could fall into someone's hands and be turned into a bomb, they might be liable. That legislation is floating around at the moment, and there's a lot more coming. It's really up to the creativity and political advantage of whoever wants to propose such things, but we're going to see a lot more possible legislation and possible regulation of on-line systems.

Two more brief subjects. One of the real issues for system operators, one of the things that's really naughty, just really impossible to deal with the way things currently are, is that we're not dealing with one unitary set of rules. We're not dealing with just Federal rules — and even the Federal rules kind of contradict each other half the time. We're dealing with Federal rules in this country, in the United States, but we're also dealing with potentially up to 50 states with different rules. All the rules could work a little differently, and we've already seen, as with the case where the bulletin board in California was prosecuted in Tennessee, that a bulletin board in California — which is a fairly liberal state where they might get away with whatever adult materials they had there — can be subjected to the power of a court in Tennessee, which

might be a more repressive kind of state when it comes to adult materials. We've already seen this happen. That's just a first case. Anybody running an on-line system with a national coverage — which is pretty much anybody on the Web, for one thing — unless they're doing some very good filtering, if they're concerned at all about legal regulations applying to what they're doing they should be concerned about all the states and what they might be enacting from week to week, and how these things might be interpreted from week to week.

There's a kind of legal work called "Blue Sky" work that lawyers have done, like in the securities area, which we can use for an analogy to [the problem with] the different states. In a securities offering, when you raise money it is Federal securities laws that say what you have to do. Then, in every state where you're asking people for money, you also have to see if your offering is okay under the laws of that state. This is incredibly fact-intensive, drudging work, and in large firms they actually hire these Blue Sky specialists who do nothing but that for a couple of years. Now, that's just securities laws; just think if a system operator had to do Blue Sky work for every kind of legal regulation. Maybe not for everything, since copyright is just Federal; but [they'd have to do it for] adult materials, various kinds of criminal activities, privacy violations that might be a violation of one state but not another — things like that.

There's a lot of stuff to keep track of. I don't think any human lawyer can keep track of it, and if lawyers can't keep track of it it's hard expect people who aren't lawyers to keep track of it, and these are the people who really might be doing any of the monitoring. This is a problem that I have a feeling is going to manifest in some fashion, or a number of fashions, over a while. Generally, people are going to start understanding how intractable it is to have a lot of different sources of rules all applying to one place. One of the problems you get very fast is "the lowest common denominator" rule or "the most repressive regime" rule, which is that you can only have stuff on your system that's offensive to no one. Offensive to no one can mean attractive to no one also, and that's one of the paths down which the very disorderly legal scene is leading us right now. And this, again, gets multiplied by the facts that we have a lot of countries.

On a practical level, if I'm sitting plunk in the middle of the United States and I do something that offends the Thailand government, it's not very likely that anything's going to happen to me. They're not very likely going to be able to extradite, unless I was really some kind of weird terrorist or something. If it was just something that broke Thailand laws and somebody from Thailand happened to call in, on the practical level, on the exercise of state power level, they'll never get me. But there's a lot of companies and people that are operating on a multinational level that set up business associations and so forth. There was a case once where CompuServe had a game, *Wolfenstein 3-D* — which was the predecessor to the totally famous *Doom* game — which had a lot of Nazi imagery in it. Somewhere it became known that there's a German law that outlaws Nazi imagery in games and things like that, and even though no official accusation had been made by any German government or agency official, it all of a sudden looked like it was pretty risky to have *Wolfenstein 3-D* downloadable within Germany.

Almost all the system operators within the CompuServe system — and there are a lot of different areas — all got rid of *Wolfenstein 3-D*, which means it was no longer available not only in Germany but everywhere else, like here, where it's perfectly legal, at least on CompuServe. That was a forerunner. It didn't make any news or anything, but it was a good illustration of the kind of thing we're looking at and how another state's laws or another country's laws can lead to a heavy-duty repression of what we're finding on-line, and create a lot of confusion for system operators.

A lot of these issues are resolved with one's own members very simply and easily. To the extent that we're not just anonymously linking on the Web, we can have agreements with people if we have any kind of on-line service that we're selling to people. Agreements will

regulate your relationships with your own users; the question is, what about the rest of the world that doesn't have deals with you? What if there's something that they can sue you about? The issue remains no matter what you do with contracts.

I'll wrap up by saying, as an overview, that as the cases keep happening relating to system operator liability and new laws get proposed and worked on, there's a few questions that are going to come up over and over and there are themes that are going to keep surfacing. One is, are on-line systems important enough to protect from undue legal responsibilities? I would say that until a few years ago a lot of people would say they are not very important at all. There was a time they were considered so unimportant that when an MTV VJ said to MTV, "I want to use mtv.com for a domain name," they said, "What's that? Fine. Who cares? There's no money there." Of course, a year later they were fighting about it because all of a sudden on-line became important. On-line is becoming so important — and important to very large companies as well as small ones — that the importance of keeping them relatively unburdened is going to become a stronger and stronger theme, although it will be balanced against particular industry and special interest groups. If, at some point, it seems that an industry group has something to benefit from opposing rights for other groups, even if it's at slightly their own expense, they might do that.

Newspapers are an example. Newspapers have a lot of traditional legal benefits, and they're going on-line. To the extent that they can assert that those traditional legal benefits that were for newspapers as opposed to other businesses should keep going in an on-line world, you could actually see some fairly absurd distinctions attempted to be drawn between newspapers on-line and other companies on-line. Other companies on-line should be at some disadvantage because they are not the vaunted press, just as an example.

Another big question is whether monitoring obligations, in fact, create undue burdens for system operators. That's kind of the big, unanswered question. Everybody says, "Oh we can't monitor. It's impossible." It's easy to say. Is it true? Prodigy monitored for a while; Prodigy was also in the red, and actually only started turning a profit a year or two ago — and that's coincidentally when they stopped monitoring. So maybe monitoring obligations or monitoring activities do have a lot to do with how much money you can make. I mean, that just might be coincidence, but if anybody points to Prodigy and says, "Yeah, they did it. They did it and they were losing money at the same time," that's something, if there's ever a legal question that comes up.

Different services can do different monitoring. Some services — maybe lower-traffic services, based on what they're charging for what — can actually look at everything, and it may be that when a company running a service can look at everything and still make a profit, the law for those services may be that they're supposed to look at everything. That may be how it works out.

With other services there's no ghost of a chance that they can ever look at a lot of what's on there. Then the law for those services and what they do — which may not be at all the same as what the first kind of service does — will be that they don't have to look or they only have to look some. Would that be considered unfair treatment of different services? It would be hard to say. It depends on whether those distinctions that might end up being made actually make sense. I know I'm speaking very abstractly; we can talk more concretely about this in the question and answer session if you'd like.

Finally — and this is the part that I find difficult, because I never came up with an answer for this and it's tough to me — there are dangerous and illegal materials on-line. There are things that are national security breaches, and there are things that are morally depraved and all kinds of bad things, and it is socially desirable to have somebody pulling this stuff off when they can. It's a question of motivation and control.

If the system operators have the power to take it off, system operators are one of the few kinds of entities — maybe the only other, aside from the original poster — who can take the dangerous materials off the system. If you don't impose liability on the system operator, who's going to handle those illegal materials? Who's going to take it off the system? Who's going to prevent damage and injury and further damage and injury from occurring? So there's a question of social allocation of responsibility. Who is in the best position to do something about it? That can seem incredibly unfair if you're just trying to do some business, [to think] that you have this responsibility for stuff that's not even yours; but it may be kind of an accident of the kind of business it is, that if you're in the position of control you may be asked to take on that responsibility because you're the only person who can.

That's the end of my comments for now, and if we have some time at the end we can talk about other stuff. Thank you.

Ken Rosenthal: I'm going to just speak briefly about the subject of subpoenas and search warrants. As system operators you are the location of valuable information, and of lots of information. Information, in the criminal justice system in particular, is an important commodity. I spoke this morning, for those of you that were here, about the [Stephen Jackson Games] case; if you weren't here you may have heard about it. There have been a couple of highly publicized instances where law enforcement, seeking information, has used their powers of search and seizure to grab the computer system on which they felt information resides. What I want to talk about is what you do if you are confronted, if you are in the unfortunate position of being confronted with that situation.

There are a couple of things to understand. The Fourth Amendment is a critical part of our Constitutional Bill of Rights. When you study those procedural rights in law school or in history, you learn that they are a founding tenant of our government. In England they were searching, with general warrants, the homes of publishers of seditious material, so it's something that courts recognize as very fundamental. Fourth Amendment law has been construed to require government, unless there's an exceptional reason, to get a warrant before they go into a home and take material or go into a business and take material. But Fourth Amendment law has also been construed to mean that it's not necessary that the person whose home or business is being searched is a suspect in criminal activity.

There was a case involving the Stanford University *Daily* newspaper, back in the 70's, I believe, in which there had been an incident at the university hospital in which some university police officers were injured. It was reported in the paper, and based on the [newspaper] reports the university police surmised that the reporter had been in a location where he would have been able to see the perpetrators of this injury, and if he took photographs would have been able to photograph them. Pursuant to a search warrant, the *Stanford Daily* was searched, and their newspaper files were searched even though there was never any claim that they were involved in a crime.

Stanford Daily then brought a lawsuit against the university policemen saying that was a violation of their Fourth Amendment rights. [The newspaper said] that the rule should be under the Fourth Amendment, and if the government is going to go after somebody who is not accused of a crime to gather evidence in order to prepare a case, they should be required to use a subpoena and not a search warrant. The district court upheld that right, and said if we're going to allow government, by force, to go in and take information and intrude on the privacy of non-criminal citizens, they should use the less intrusive means of a subpoena.

I'm going to talk this afternoon primarily about why that is less intrusive, and what the differences are. Unfortunately, the U.S. Supreme Court said that's ridiculous, that there's

nothing in our Fourth Amendment or our prior case law that says the government has to proceed by subpoena rather than by search warrant.

In fact, under the Electronic Communications and Privacy Act, there is some suggestion, as I read it, that government doesn't even have that option when they're going after stored electronic data that's less than six months old — they have to use a search warrant rather than a subpoena.

So let's suppose that, for whatever reason, there has been a search warrant issued that identifies your computer system as a location that should be searched. What is likely to happen under that scenario? What is likely to happen is that you will get no prior notice of the fact that a search warrant is coming. Although there's no claim that your system itself was involved in crime, you will be faced with the unhappy situation of policemen arriving at your door. The first thing you should do before you let them in is see whether they have a legal authority to do so, and under our Fourth Amendment they have to have a warrant from a court unless there's exigent circumstances. It would be unlikely in the extreme that there would be exigent circumstances involving the data on a computer system, so they have to have a warrant and you're entitled to see that warrant.

But if they have a warrant, they're entitled to come in and they're entitled to search for what that warrant authorizes them to search for. You're not entitled to very much at that point, which is the problem with the search warrant as opposed to a subpoena — that is, you will have had absolutely no input into what they're searching for and how the warrant is worded. I included this in the materials that some of you may have gotten from this morning, and if you haven't gotten them all registrants will be getting a CD-ROM within three weeks of this date which will have all of the materials from all of the seminars on them. Unfortunately, we don't have excess copies of the material that quotes from the search warrant that was used in the [Stephen Jackson Games] case, and it's extremely broad.

Pursuant to that warrant, police officers and federal agents went into the bulletin board's last publisher in Austin, Texas and took their bulletin board system, their computers — that shut them down — and in addition to their computers they took a lot of other stuff that couldn't have had, by any stretch, the information they were looking for. It's a crime in virtually every jurisdiction to interfere with the execution of a search warrant, so you'll have to understand that as outrageous as it may be, the time that you're going to litigate this and you're going to challenge this is going to be when you can get a lawyer on the scene, perhaps at that moment or afterwards in civil court.

I'm going to come back to the search warrant situation, but I just want to contrast that with the subpoena. A subpoena is something that may be issued by law enforcement to gather data, but if you should be fortunate enough to be served with a subpoena rather than a search warrant, you have many more options.

Number one, there's a time within which you need to respond to that subpoena. That gives you time to get in touch with a lawyer, and it gives you time for you and your lawyer to get in touch with the U.S. Attorney or the agent who's referenced on that subpoena and negotiate with them or talk to them about why that subpoena may be too broad. If you're not satisfied with the results you get to go into a court — whether it's U.S. district court or whatever court has jurisdiction over this case or this investigation — and move to quash the subpoena or limit the subpoena. Furthermore, if you're faced with a subpoena the person who's going to search for and collect the data, and who's going to furnish it to the government, is going to be you, the person who knows what your computer system is about and knows the difference between a computer disk and a printer or modem. Printers and modems were seized as well on the [Stephen Jackson Games] case, even though there was nothing they could have had on them.

Let's go back, then, to the search warrant situation — which, unfortunately, is the situation you're probably going to be faced with if for some reason your location is the location where the government thinks there is evidence of a crime. As I said, when the search happens you are not going to have much advance notice. That's not always the case, but assuming that is the case your options then are — after the fact, and after the damage has been done as it was in this Stephen Jackson Games case — to go to the law enforcement agency that has the equipment, the documents, the evidence, whatever it was that they seized, and try to get it back. There are procedures for filing motions for return of property even if you're not a party to the action in these situations, but there are also ways that you can hopefully negotiate.

Unfortunately, once law enforcement gets its hands on the evidence they are very concerned — as we learned recently in the most publicized criminal case in quite a while — about the fact that there's going to be a defense lawyer on the other side who is going to be challenging whether it's the best evidence, whether there's a chain of custody, and whether the evidence is admissible in court. They are going to have to “process” this evidence before you get it back, even though you're not involved. That's obviously a situation where you need to get someone involved who can represent you to try and persuade the powers-that-be that they have seized too much, that the warrant is too broad, and that there are legal consequences that may follow from the fact that they haven't complied with the requirements of law.

In addition to the Fourth Amendment requirements, when you are involved with electronic communications there is a statute that governs this, and it is a very complicated statute. It is the Electronic Communications and Privacy Act, and that statute sets out requirements not only for warrants but also for what's called “super warrants” when there are certain kinds of documents that government is seeking. I'm not going to try and go through that statute, but just indicate that there are provisions under that statute, as well as other actions, that can be brought which entitle you to damages after the fact — for what good it will do you — and for violations of the requirements of the Electronic Communications and Privacy Act. There are also requirements that law enforcement will hopefully be persuaded to observe as time goes by in the seeking of this kind of information.

One of those requirements relates to the fact that there are different categories of electronic information, and there are different procedures that must be followed in seeking to get them. What [Stephen Jackson Games] sought to do, and was successful in doing in the case that I mentioned before, was in bringing a civil action pointing out that the government had violated provisions not only of that act but of a privacy protection act. [Stephen Jackson Games] was deemed the publisher and was able to get substantial damages and attorney's fees for the seizure of their equipment. The bad news is that they weren't able to do it for months and months, and despite the fact that they had attorneys involved and they had political figures involved they were without the use of their equipment for a long period of time. Hopefully these things don't happen too often; but my purpose at this point was just to outline the steps that are likely to be followed, or at least what you can expect.

I think what I'm going to do at this point is turn to a question and answer period to see what, if anything, we need to talk about in terms of the Electronic Privacy Act or the search warrant procedure.

Our goal here was to try to leave enough time for questions so that people's concerns could be responded to.

Lance Rose: Okay. Over there.

M: [inaudible]

Lance Rose: The question is, is there some kind of legal problem of liability if somebody points at somebody else with a Web link and the person that is pointed to has a problem with it?

M: To give you an example, I represent an insurance company and somebody created a Web link that [inaudible] this book form and sent it.

Lance Rose: Okay, this man is with an insurance company with a Web site, and somebody out there in left field gave people a form and said, "fill this form out and send it to that Web site and the insurance company will give you a quote," even though there was no arrangement between the two companies.

This is actually a good case because there is no legal right to sever Web links, per se. There is no such thing as a law that says you can't link to my site. You've got to hang it on something else, something else that people have said to be doing wrong. In a case like this — if one company says that if you send something to another company they'll do something for you — as the intellectual property lawyer that I am, the first thing I think of is a law called Section 43(a) of the Lanham Act, which is mostly a trademark law. It's a federal trademark law, and part of that law goes beyond trademarks and says that any time a company says something false about its own products or about another company's products, when it's talking about another company then that company can sue it under the law.

If your insurance company, speaking hypothetically — this is not official legal advice, of course — if an insurance company felt that another company was saying false things about it, the false statement being, "send quote forms to this company and they'll help you out with them," that's a false statement about what your company will do. That would seem to me to lie very well within a trademark-style Lanham Act kind of claim. It is also an example of what would happen, in general, with a Web claim. If there is an objection to someone linking, you can't go to a court and say, "I don't want that person linking. They can't link to me." You have to have something more going on, such as a misrepresentation in a competitive situation or some kind of defamation or some kind of false association with some disreputable site or something. It has to go beyond the mere distasteful linking.

[Tape change]

Lance Rose: I thought I understood that question at first. The question started out being, "do the same laws of libel and slander apply in the on-line media as in the print media?" The short answer is "yes," but are you talking about a place where anybody can come in and put in their two cents, or are you talking about a published situation?

M: [inaudible]

Lance Rose: Okay. If you're running an area where anybody can come in and post messages, and you're the person running the area and you don't want them there, that's not really the law of libel, that's the law of owning your own press, so to speak. If you don't want somebody to be using your forum as a place for their speech and you are the proprietor, you have that right. This actually came up in our morning session; around the edges of this there is a little bit of legal development that has to do with shopping centers and has to do with state constitutional rights of free speech — not federal, but state constitutional free speech rights. It has been held, in a number of states — a small number, like five or six — that, for instance, shopping center parking lots can be used by people who are doing political leafleting because these are places

where the public tends to gather in that local area. The town center is gone, so the mall takes its place. But these are under state constitutions, and shopping centers and malls are historically well-established things.

The on-line world, as it were, is just starting. It would be very hard to convince the court that any one on-line forum is so predominant, so ubiquitous, that people with a certain message legally have to be given access to that place to give their message as opposed to just starting up their own Web site or starting up their own bulletin board. I suppose there was a threat, for a hot minute, that the Microsoft network was going to be that place; but that doesn't really seem to be turning out that way for now.

M: [inaudible]

Lance Rose: I'm going to have to ask for a little more clarity. The question so far is, at a corporation or university Home Page, does a disclaimer release them from liability? I need more detail for that question.

M: [inaudible]

Lance Rose: Okay, are you saying, for instance, that if a university has a Web site and students can publish pages on that site, can the university exempt itself from liability by disclaiming any connection between itself and the students posting at the site?

M: Which they are enabling them to do.

Lance Rose: It could help. What you're doing, when you get into that kind of Web site operation, you are actually starting to get very close to that CompuServe vs. [Cubby] situation. Again, in the CompuServe case, there was a newsletter being published through CompuServe, and CompuServe said it wasn't specifically aware of the contents of every issue of that newsletter. The court believed it — I guess it was a believable statement — and said, "CompuServe, you're not responsible for everything that you don't know about that's on your system."

I think that applies in a university Web site with Web pages published by its students, especially if the students can refresh any time. The university could very easily say, "I didn't know what the person put up there today, that little rat," and thus distance themselves from the student. That's what the disclaimer is, to distance themselves from the little reprobates.

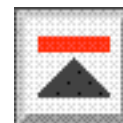
Yes, a disclaimer would help but it wouldn't settle the issue. If the university, in fact, knew everything that was going on — let's say they had a highly-moderated site, and all pages had to go through some university functionary who checked the pages. The disclaimer to the public is not going to take away the responsibility they have kind of taken on already themselves, as editors, so you have to look at the whole operation. The disclaimer statement alone is not going to do the trick one way or the other.

We've got to go. I guess we can talk on the side, but this general session is over. Thank you.

Wayne Martino: We have some handout materials; there's not enough to go around, because there's a lot larger crowd than we thought was going to be here. We're going to put them out. There's only about 20. All of the material that's here, if you were here for the morning session, it is already incorporated in the morning book that was handed out. If anybody would like these materials — and what they are is articles on making and enforcing electronic contracts and the

legal aspects of e-mail — if anyone would like those materials I'll send them to you by e-mail.
My address is wmartino@callnet.com.

INTERNET LEGAL DOING BUSINESS IN CYBERSPACE



MODERATOR

Wayne Martino, Esq., P.C.
Brenner, Saltzman & Wallman

SPEAKER

George Brencher, Esq.
Brenner, Saltzman & Wallman

Wayne Martino: This session is on “Doing Business in Cyberspace.” We’re going to cover a bunch of different topical areas today. The first one will be on making and enforcing electronic contracts. We’ll then talk about member agreements and content provider agreements very quickly; Margie Seif from AT&T was supposed to do that, but unfortunately she had to go as well, so I’ll run through that for you. We will then talk about emerging issues and the legal aspects of using e-mail.

I’d like to now introduce George Brencher. He’s an associate at Brenner, Saltzman & Wallman in Newhaven, Connecticut. George is a graduate of Penn University and Penn Law School, and he had previously clerked for José Cabranas, the Chief District Judge in the State of Connecticut. George.

George Brencher: Good afternoon. We’ll be talking this afternoon about making and enforcing electronic contracts. For those of you who have a great deal of legal training some of it may be a bit tiresome; but for those of you who haven’t, I think it will be helpful.

As commercial use of the Internet, on-line services and electronic messaging systems grows, you’ll see more and more business transactions being carried on in cyberspace rather than in the real world. Increasingly, these transactions will result in electronic rather than traditional paper contracts. This discussion is intended to analyze several types of electronic contracting situations in terms of traditional principles of contract law.

There are five types of electronic contracts that we’re going to be looking at: electronic data interchange, or EDI; the on-line licensing of computer software; the on-line sale of goods; the provision of on-line services; and what I call “negotiated” contracts.

Before looking at these specific contracts I’m going to go through some of the basics of contract law. I hope it doesn’t bring back any unpleasant memories for those of you who’ve been to law school...

The first question relevant to the basics of contract law is, “what is a contract?” Put simply, a contract is an agreement between two parties that the law will enforce; it is a promise or a set of promises that the law will recognize. There are a variety of legal rules that govern whether contracts are enforceable, and there are really two main sources of such rules.

The first is the Common Law, and the second is the Uniform Commercial Code, or UCC. The Common Law is the judge-made law of legal cases that’s mostly what you’ve been hearing discussed today in other contexts. The Common Law has been collected and summarized and organized in what are known as “Restatements” on a couple of occasions, and the basic source of contract law is called the “Restatement of Contracts.” The Restatement doesn’t really cover the entire ground, because the UCC governs the sales of goods. The UCC is a statute — it’s a model statute, adopted in every state other than Louisiana in some form or another.

First you’re going to get a little bit of background governing contract formation. For a contract to be formed the parties must reach an agreement to which they mutually assent.

Lawyers often use the phrase “a meeting of the minds” to describe this concept of mutual assent. The basic concept of mutual assent is that the parties must clearly understand each other, and the subject matter of their agreement, in order for a contract to be said to exist. The process of reaching a meeting of the minds takes place through what lawyers refer to as “offer and acceptance.” In other words, one party proposes a bargain — that’s the offer — and the other party accepts the bargain — that’s the acceptance. This kind of a framework sounds quite simplistic, but it’s useful in analyzing some of the issues that arise in on-line contracts.

The second legal concept that’s relevant in the on-line circumstance is known as the Statute of Frauds. Most people are familiar with the concept that legal contracts, in order to be enforced, must be in writing. It is not entirely accurate, but it is true for some contracts. The modern version of this concept is found in both the UCC and the Restatement, and in its modern version the Statute of Frauds requires contracts to be in writing and to be signed by the parties in order to be enforceable. It doesn’t apply to all contracts, however. It does apply to contracts dealing with land, contracts for the sale of goods with a price of more than \$500 and contracts which by their terms cannot be performed within one year. In its evolved form the Statute of Frauds has kind of loosened up quite a bit. Law students spend a tremendous amount of time studying the early application of the Statute of Frauds, which was quite strict.

However, as new technology has evolved and new business practices have evolved, courts and commentators have been somewhat flexible with both requirements. For example, it’s no longer the case that every term of a contract needs to be set forth in writing. Now only the essential terms need to be set forth, and an actual signature is not necessarily required; what is required is a symbol or some other means of authentication that identifies the party against whom the contract is going to be enforced.

Some examples of the technology that has not been really impeded by the Statute of Frauds are telexes, telegraphs, and to a certain extent faxes, although there is some uncertainty about the applicability of the Statute of Frauds to faxes. There haven’t been any reported cases that I know of that actually validate the use of faxes for entering into contracts.

Now, about the various types of electronic contracts we’re going to be talking about... The first one is “electronic data interchange,” or EDI. It’s probably the least interesting from a contract law perspective, but it’s also sort of the most commonly used type of transaction now. It may be the most dominant use of computer technology and networking technology for commercial applications that we have; it’s really an essential part of “just in time” manufacturing and that sort of thing.

The chief characteristic of EDI, and the thing that really makes it somewhat less challenging from a contract perspective, is that the parties to EDI transactions generally agree in advance on a structure and procedure for carrying out their on-line transactions, and they frequently do this in a written document that they refer to as a “trading partner agreement.”

Various legal groups have published model trading partner agreements, including the American Bar Association, if you should be interested. Because the parties have entered into this written agreement in advance, EDI transactions are pretty well-structured. They’ve set out agreed-upon procedures for communicating, for example, purchase orders and acceptances of purchase orders, and the electronic aspect of EDI for that purpose is really almost an aside. It’s sort of a fulfillment of the written contracts terms; that means that offer and acceptance is really not a problem in the EDI context. The Statute of Frauds is probably not an issue either, partially because so much of EDI transactions are executed on a computer-to-computer basis without human intervention. The model trading partner agreement, and most trading partner agreements actually used out there in the field, have very detailed record-keeping and audit procedures, so that when a court goes to look at what the written backup for the transaction

is, the parties can produce these very, very well-documented electronic records of all the trades. That probably satisfies the Statute of Frauds requirement for writing.

With respect to the signature requirement, again you have a lot of computer-to-computer interaction in EDI, and there are very sophisticated authentication procedures built into that, and courts are probably likely to accept those kind of authentication procedures as sufficient for Statute of Fraud purposes.

The next kind of contract we'll be talking about is on-line software licensing. This is becoming more and more common. I haven't had a chance to check out the Web site, but I assume that this is what Microsoft is going to be doing as they start selling their software applications through resellers over the Internet. It's probably going to become the alternative of choice for many manufacturers to "shrink-wrap" licensing.

Probably most of you are familiar with shrink-wrap licenses, the licenses that are printed on the inside of the software packaging, or sometimes on the envelope holding the CD-ROM or the disc. There's usually a statement on there that says if you break the seal on the envelope or the packaging, or if you install it in your computer, you are then accepting the terms of all of that fine print in the license. Shrink-wrap licenses were originally developed as an alternative to entering into written agreements because it was really impractical for software manufacturers to require the purchasers of the software to actually enter into written agreements.

Unfortunately for the software manufacturers, shrink-wrap licenses raise a large number of enforceability issues, and looking at these issues will help us understand a bit about some of the issues that will arise in the on-line context.

The first of the issues arising with shrink-wrap licenses is the fact that the purchaser of the software never sees the terms of the shrink-wrap license until after they bring the box home and open it up and go to install it on their computer. If you think about the offer and acceptance concept, that's a little bit like me agreeing to sell Wayne my bike for \$100, him paying me \$100 and taking the bike home, and then me calling him a couple of hours later and saying, "oh yeah, by the way I get to use it on Mondays and Wednesdays." You know, it's really hard to say that somehow this purchaser reached a meeting of the minds with the manufacturer on the terms of this software license if it was encased in the packaging and they paid for it before they got to read the license.

The second issue is the sort of ambiguous acceptance of those terms. Obviously, breaking a seal on an envelope or installing a disk in your computer system is somewhat less of a definite agreement to a contract than signing on the bottom line. In the software licensing context this is particularly significant, since one of the primary purposes of software licenses is to contain limitations of warranty, limitations of liability, the kind of damages you can recover from the software manufacturer if the software has bugs in it.

Typically, in consumer law those kinds of provisions in a contract need to be open and conspicuous. The manufacturer, in order to enforce them, has to be able to demonstrate clearly that the consumer saw these things and was aware of them when they entered into the transaction. They're sort of buried down on the bottom line in that envelope that holds the disc, and there is a serious question as to whether or not the software manufacturers will be able to enforce those kinds of limitations. As for the Statute of Frauds issue, it's not significant in the shrink-wrap license areas, since most software that's licensed in that fashion is under \$500 in price, and so not necessarily within the Statute of Frauds.

If you take what we know now about shrink-wrap licenses and you apply that to the on-line registration of software, you see that some of these problems can be taken care of, though it depends a bit on the structure of the on-line's registration arrangement. If the purchaser is only registering the software on-line and not buying the software on-line, you never really get rid of the problem of the purchaser going out, paying their \$150, coming home, putting it on

the computer and then finding that they're faced with a sort of take-it-or-leave-it situation with the terms of the license. Obviously, if the software is being purchased on-line, what you want to do is show the software purchaser all the terms and conditions before they commit to paying, that way it's part of the sale transaction.

If you're concerned about the ambiguity of acceptance that you get from breaking a seal or installing a disk, you can solve that in the on-line context by requiring some kind of obvious action of acceptance, like having the purchaser type "I accept" at the bottom of the screen when they register the software, and keeping an electronic record of that transaction so that you can later produce it to show that they've definitely agreed to those terms. Again, if you're going to use limitations on warranties and that sort of thing, those things should be open and conspicuous.

With respect to the Statute of Frauds, it's to the extent that it's relevant because you're talking about things over \$500. It may be difficult to satisfy on the on-line context because there's really no paper record, but if you look at the EDI context, it may be possible to convince a court that your record-keeping measures are sufficient, your electronic record-keeping methods are sufficient, and that this is really a trustworthy record of the transaction.

Turning now to the on-line sale of goods, it's really a similar analysis to on-line software registration, where you're selling the software on-line. It's easy to make the terms of the purchase visible up front to the purchaser. It's easy to keep a record of their affirmative assent to those terms. If your payment mechanism is other than on-line, you can then send them a hard copy of the terms and conditions when you send them an invoice or some other request for payment. This again will solve the Statute of Frauds issues, because you will have reduced it to at least something in writing which you have provided to the purchaser. If you provide this writing to the purchaser and then they then send in their payment, it's pretty clear that they've agreed to those terms.

If payment is made on-line, one idea is to then send a copy of those terms and conditions to the purchaser by e-mail, so that you can at least use something that a court may find more familiar as a means of memorializing the terms in something closer to a writing. But, in general, the Statute of Frauds should be no more of a problem on the on-line goods situation than it is on the on-line registration situation.

The next transaction we'll discuss is the provision of on-line services. You're seeing providers of on-line services moving more and more toward purely electronic contracts. A lot of earlier contracts are written that contain pointers to electronics terms of service, and things like that may change from time to time. I'm not really concerned with that, because then you're really looking at a written agreement; what I'm really concerned with here is a purely electronic transaction. The main issue for these kinds of transactions is that the users of the service have an opportunity to see the terms of service before they enter into the transaction, and review the content, and then you can record their acceptance electronically. Whether or not you require this review and acceptance before you show them the material depends a lot on a balance between their inconvenience and your desire to ever enforce that agreement, and that's a decision that you really have to make as a business matter.

In a subscriber-based service where you're going to be sending them some kind of request for payment, obviously you can follow up with a written [copy] or e-mail [with the] terms of service. In an open scenario, where you're going to be providing services free of charge — on a Web site, for example — demonstrating acceptance is pretty difficult, although there is one feature of a lot of Web sites that I do want to touch on, and that is what some people are referring to as "Web wraps." These are sort of the terms of licensing and terms of use that you see in Web pages.

Most of the time they're only accessible if you go all the way down to the bottom of that Web page, and you go through a link on the copyright notice, and then all of a sudden there's a two or three screen listing of terms and conditions. The enforceability of these terms and conditions is probably weak; they're certainly not open and conspicuous to the extent that you're looking to limit liability or have disclaimers. As part of preparing for this, I kind of went out to see what some people were doing on big commercial Web sites.

I had a hard time finding the terms and conditions. The idea that they're hard to find even if you know they're there suggests that people who are supposed to be bound — who aren't supposed to know they're there — probably aren't finding them very easily. If you have a site where you think that these things are important you're going to have to try to make it a little bit more conspicuous, so that you could demonstrate that people actually saw these things if you want to enforce them.

The Statute of Frauds really is not an issue with the provision of on-line services because it generally does not apply to service contracts, particularly short-term service contracts.

The last category of agreements I'm going to talk about is what you can refer to as "negotiated agreements." Negotiated agreements — really what we are talking about has been sort of "form" contracts, very simple transactions — you want to buy this software, you want to access this database. Negotiated agreements are what I mean by what are more complicated business transactions, ones that would actually be negotiated between the parties. The back-and-forth negotiation is increasingly taking place on-line, where parties are doing these things through e-mail. The important thing in that context is that when you get to the end, and everybody thinks they've reached an agreement, that both parties agree on an identical document. The fact that you've been sending drafts back and forth in a variety of messages can be a problem for each of the parties to demonstrate that the other party agreed to that identical document. Really, the thing to do is to make use of encryption technology for this purpose; and I'm not going to get into encryption technology, but there are a wealth of terrific articles for lawyers and others on practical applications of encryption for doing negotiated agreements on-line.

Finally — and I'm not really going to get into these issues — but if you look in your written materials, I've talked a little bit about some of the proposed revisions to Article II of the UCC, which impacts on some of the issues that I've just gone through, as well as some recent digital signature legislation. I think that the proposed revisions will ultimately take care of some of the problems that we've talked about, particularly in the software licensing area.

The problem is, if you're not familiar with how the UCC works — a group of commissioners get together, they draft legislation, they circulate it. They get comments, they revise it. That usually takes a year or more, and then they come out with a final recommendation and it's up to all of the various state legislatures to choose to adopt or not adopt all or some of that statute. So if you're looking at it realistically, it's going to be quite some time before the revised Article II actually comes into play — if at all.

And with respect to digital signature legislation, two states have enacted digital signature legislation in this past year: Wyoming and Utah. The statutes aren't very long or very complicated, and if you're interested in the topic it's certainly worth looking into.

Wayne Martino: (Just hold on a second. I've got to move to a different presentation.) I thought that I would run through a "membership agreement and conditional-use policy," and then a "content provider agreement," just as an example of the implications of some of the things that are contained in the agreements, and why.

The first is the membership agreement, and the other is the conditional-use policies that many of you are familiar with when you sign on to on-line services. I think George's point of the

enforceability of the terms and conditions that I'm going to talk about is still an open question as to whether or not people are really manifesting any assent; many times there's no opportunity to either review them before the person signs on to the system, or it's difficult to find. There probably will be some litigation over this; there'll probably be some litigation over whether it's enforceable as a contract of adhesion. Those areas really aren't settled yet, but I'm sure that in the near future that they will be.

The contents of those agreements will... The major issues will be as follows: the first one is going to be the limitations on the user. What activities do you not want going on if you're a system provider, or if you're providing a bulletin board for people to access? They're pretty well settled as to what they don't want you to do; they don't want any defamatory harassing or illegal conduct. Quite simply, they could potentially be liable for that. There are some decisions out there in the "[Cubby] versus CompuServe" and the "Stratton-Oakmont" that go in different directions as to whether or not there is liability, but there is a concern in that area that they will prohibit you from making those types of uses.

They are also concerned about copyright infringing and whether or not they become responsible under a strict liability theory for copyright infringement. They will tell you that they don't want you putting anything on their system if you don't have permission; in some instances you may actually find people telling you that they don't care whether you have permission or not, they don't want you putting anybody else's copyrighted material on unless you provide them with permission.

The pornography, obscene materials — this is again depending on what the orientation of the system may be, but many of them will prohibit you from doing that for a variety of reasons, probably the most important of which is to the extent that you not specifically dedicate it to that use. They don't want it on their system.

And the last one is that many of the agreements will contain provisions that eliminate any advertising, solicitation or promotion. Basically, you will see people saying they don't want you to go and advertise on our site, and if you want to do that you've got to pay for it.

The next section of those agreements is generally the reservation of rights of the operator. The first one is their ability to monitor and edit content; that's becoming a real hot issue now, both from a First Amendment point of view, as to whether or not they can do that, but more importantly, if they do that, whether or not they potentially have liability. Again, the decision of Stratton-Oakmont — which, even though the case has been withdrawn, the decision is still out there — suggested they may be publishers and not distributors, and therefore may have some liability for that.

One of the emerging areas is whether or not the information about a user's habits are going to be available. It's an emerging issue right now as to whether or not, not necessarily what individual people do, but whether or not how many people go to visit what sites, and what kind of demographic information will be available. I'm seeing companies go different ways on that as to whether they want to include or don't want to include that term that says that they can use that information. I think some of the more enlightened ones are giving people the right to opt out of that, so that among other things, there are people who are not finding e-mail about specific topical areas because they visited certain areas.

The last one is a pretty clear one; that they generally will retain the ability to restrict your access or to terminate it.

With respect to the content, there are some very simple issues. [The first is] who owns the content. Generally, the system providers will say that anything you post to our system is owned by us, and you don't retain any rights to it. Maybe a right to use it yourself, but in terms of our right, the system operator's right to republish it, they'll maintain that. They will tell you that anything that you find on their system, they don't want you having any right to reproduce it

for commercial purposes; they want those rights for themselves, so they will limit you there. And they will also tell you that they are not responsible for any third-party content — although you're seeing now that CompuServe, I think, just announced that they're going to create a site that will be a "family" site, and that they're going to monitor it. It's going to be interesting to see how they do that, and if they're successful.

The next section of the agreement that George had touched on is the limitation of liabilities, and I'll quickly run through these. Maybe we start with the concept of (unintelligible) in larger print, and bold. There's a concept that it's got to be open and conspicuous in order for it to be enforceable, and generally you'll see it in bold, you'll see it in large print so that it differentiates it from the remainder of the agreement, so that you can in fact try to get yourself out of liabilities.

This area may be probably one of the more critical areas in terms of enforceability that a systems operator, or somebody who's operating the cyberpeople, are opposed to and is going to be concerned about, especially if they are providing the service for free. They will generally indicate that they should be there, and that they're not a publisher; they will also indicate that it's on an as-is-available basis. [They'll indicate that] there could be bugs in the system, and that things may happen, and we're not guaranteeing to you that it's going to remain on-line the entire time. They will also try to exclude their liability for third-party actions, and will also attempt to limit their damages to indicate that they're not responsible for special or consequential damages. They may also indicate that the damages are limited to a certain dollar amount, possibly what they were paid, if they were paid for the service.

The last two items: I think you're seeing more and more of having an internal statute of limitations — one that will limit the time period that anybody can ever bring a claim against them, and not rely on UCC provisions or other state law provisions that could make the time period anywhere from two years to six years.

And the last area that you'll see in contracts is a choice of law, arbitration and jurisdictional issue. What law is going to govern this contract? You've got users who may be anywhere in the world. The systems operators will generally try to include a choice of what law is going to govern; I would suggest to people that if there's a possibility of any real litigation they try to do it through arbitration, for a variety of reasons. It's probably less expensive, but certainly it's going to be private; and if you're a large provider, I'd suggest to you that that's a good way to proceed. I think it's been successful in other areas, in the securities areas, for example, where the industry basically said, "we're going to arbitrate as much of this as we can through a member of [inaudible]." I would suggest that you do that.

The last thing is a question of jurisdiction, which we'll get into later. If you're a provider, where can you be sued? The way that many people are doing business on the Net right now is to be content providers.

And I'm just going to quickly run through the terms of those agreements, or at least the major terms of what agreements they're going to have with people that are providing content on their system. The first one is how long is the agreement going to be for, and under what circumstances it can be terminated. Can the agreement be terminated at will by either side, or are there going to be quantitative reasons? For example, there may be dollar numbers that are involved that says we've got to make certain dollars off your site or we don't want your content; or there may be qualitative reasons that they may try to incorporate into the agreement, [that say] under what provisions they can terminate you.

The obligations of the purchaser will be to manage the area to the extent that they are editing or facilitating communication between those people that are doing the system, and to promote it. There may be requirements that they do some promotional activities and enforce the policies. To the extent that anybody here is a content provider, I think the enforcement of

policy [is what] you've got to be very concerned about, because that's potential liability for you even though the "deep pocket" may be the systems operator.

What you will see in these agreements is that if you're responsible for monitoring the content, you've got to be vigilant about that and about enforcing their policies, not only from a termination point of view but from a liability point of view. You'll also see in these agreements that there'll be indemnification provisions, where they will ask the content provider to indemnify them to the extent that if they ever post bad material, they failed to adhere to the policies. The same limitations on liabilities that I had spoken about earlier would be included on this, and generally they'll go one way. The systems operator will say, "I'm not liable for everything, and we'll try to make the content provider liable for everything." Again, as the Net is becoming more and more content-oriented, tying somebody up and having them be only on your system, and providing your content, is good to the extent that you are allowing them to build a following. This may be a very important revision, as well; once the relationship terminates, can they go out and do this for somebody else? Is there a "cooling off" period, during which they cannot maintain the same type of forum that they had maintained yours?

With respect to content ownership, I've seen it go both ways. I think it's more likely that the content... In this one, whoever is providing and monitoring the forum is going to own it. That's a little bit hollow, because the system's operators basically are going to say, "yeah, you can own it, but what we're going to do is take a license to use it for whatever purposes that we want." So to some extent there may be some dual ownership.

One of the last items is confidentiality, whether or not you want to have a provision in there that they're not going to talk about the terms and conditions of the agreement. Again, to the extent that this is becoming competitive, a competitive marketplace for content, confidentiality becomes more important.

And the last issue is the choice of law, arbitration or jurisdiction. With content providers, these types of agreements are probably a lot more enforceable because generally they are negotiated contracts.

I think what we're going to do now is turn to the legal aspects of using e-mail. We're going to talk a little bit about the legal aspects of using e-mail. It may be one of the less glamorous topics today, but if you are a business that makes extensive use of e-mail, it's probably something that is worth thinking about.

Obviously, the use of e-mail by all kinds of business people, lawyers included, is becoming increasingly popular. I have seen figures as high as 25 million e-mail users out there. The practical benefits of e-mail are obvious; probably everyone here has used it extensively, and can appreciate how nice a tool it is to have at your disposal. However, there are a couple of concerns worth thinking about in the use of e-mail by a business organization, and these are concerns that may not be something that business managers might necessarily have thought about a whole lot.

I really think that two chief concerns are the fact that e-mail is discoverable in litigation, and also some of the security risks associated with using e-mail, depending upon the configuration of your e-mail system. I'm going to look at both of those two and then touch on a few diverse topics that are of concern.

A lot of people don't realize that e-mail is discoverable in litigation. It's really unlike any other... It's quite alike with all other communications that you might have in your business organization — memos, letters, telephone calls, that sort of thing. And it's not necessarily the written portion of the e-mail that's going to be produced; you're going to find that people are going to be either asking you — or compelling you — to go into your electronic records, your backups, and your archives, including traces of deleted and erased e-mail messages, and producing those things for litigation. Many of you probably remember this was a feature of the

Iran-Contra investigation quite a few years ago; unfortunately, it is no longer limited to those kinds of exotic cases.

If you read litigator newsletters, you see that this is becoming more and more a hot topic among litigators out there doing employment litigation and other things like that. There are a few practical assets of this discoverability; the first is that e-mail may outlast paper. If you haven't integrated your e-mail system into your normal document destruction policy, you're going to find that there are e-mails out there over time that may outlast the kind of paper records that you normally would have gone and destroyed. And again, the fact that you can go and capture these erased or deleted e-mails makes them somewhat different than paper, although word processing systems can pose some of the same threats.

The fact that e-mail is discoverable probably means that business organizations ought to think a little bit more about it in terms of a letter rather than a telephone conversation. The record of it lasts a lot longer than a telephone conversation that's written down. I'm not saying that you have to treat e-mail like some kind of a formal means of communication, but it's true that there are some things that you wouldn't say in a letter and there are probably some things that you shouldn't say in e-mail, that you might otherwise be inclined to put in e-mail because you think it's just kind of a quick, easy and passing thing. There's sort of a psychological interface with e-mail that leads people to think of it as a very casual communications medium.

A lot of companies have found out the hard way when some of those e-mails have been produced in litigation that perhaps they should have thought more carefully about what was going into the e-mails, particularly in employment litigation. There are a variety of security issues involved in using e-mail; I'm going to just really touch the surface.

Obviously, businesses use e-mail to transmit all kinds of sensitive confidential information, including trade secrets and other things which, if they were disclosed, would pose significant problems. A lot of the people who are doing this don't necessarily appreciate that there are some security risks associated with putting those things in an e-mail that may not be the kind of security risks associated with putting them in a Federal Express envelope, for example. Obviously, e-mail is subject to a risk of interception by third parties, and this is the kind of interception that could occur without being noticed by the sender or the recipient. Obviously, if your Federal Express package arrives and it's been opened, or it doesn't arrive at all, you might have some reason to believe that it was intercepted along the way; with your e-mail message you may not be able to tell that. The [inaudible] which a variety of different speakers have touched on today is really the starting point for assessing the security of e-mail.

As Ken [Rosenthal of Brenner, Saltzman and Wallman] mentioned in the last session, the [inaudible] is sort of the principal wire-tapping statute governing the interception of e-mail communications. There are a variety of exceptions to the [inaudible] that are of interest here; the principal one is the right of access, under certain circumstances, for the service provider to intercept and view e-mail message contents, although they cannot necessarily be disclosed.

Depending upon the kind of e-mail system you're using, you're going to experience varying levels of security. If you're using a modem-to-modem link or an in-house system, the security is really under your control. My understanding, from a very non-technical standpoint, is that these things can be made quite secure, and probably provide the most secure method of communication.

The next most secure would be a third-party provider like an MCI Mail, a CompuServe, or an America Online. The issues that arise there have to do with really with the [inaudible]. Under the [inaudible] a provider like an America Online technically has the right to view, although not necessarily disclose, stored e-mail — which means e-mail waiting in your mailbox to be delivered. They also have a “carve-out” where there's consent of either the recipient or the sender. If you're going to be using e-mail for this kind of confidential information, it's

probably worthwhile to look at your provider agreement and see whether somewhere buried in there you've consented to them reviewing your e-mail for any purpose. Depending upon the sensitivity of the information that you're sending, you might want to know whether the person that you're sending it to has a similar consent built into their agreement with their provider. Most of the reputable providers don't go around reading people's e-mail, but it's a possibility.

I touched on both of the issues with the third-party provider, so the third option is the Internet. The Internet obviously provides the lowest level of security. This is because your e-mail message may be routed through any number of computers; it's not going over proprietary network. Nobody's going to be able to tell you in advance whose computer it's going to bounce off of; people along the way could intercept the message if they wanted to, although they may be prohibited by the provider from doing it. These kinds of things are very hard to detect, and it's not at all clear how much passive interception of e-mail goes on out there. If you're sending highly proprietary information out over the Net, you might want to be concerned about that. Also, the [inaudible] does not prohibit inadvertent interceptions as it's going through some one of these routing systems along the way, and if somebody inadvertently intercepts it they wouldn't be prohibited from viewing its contents.

In final, the [inaudible] does not apply outside the United States, so to the extent that you're communicating trade secrets and other things by e-mail to recipients who are located in foreign jurisdictions, you may not have any kind of wire-tapping statute coverage. You really have to look into the jurisdictions through which your message is passing. I think those are the two principal concerns that people may not be aware of.

Other concerns are the ones you see listed here. The first is the possibility that e-mail is used for sexual harassment. Obviously, it's not a unique communications medium. People can pick up the telephone, people can make casual remarks, but there are aspects of using e-mail which may get particularly susceptible to this kind of use. In one reported account, an employee was sent 6,700 harassing messages in a ten-day period via e-mail. Obviously, if the employee who's sending the messages had to walk by the desk and drop off a note every time they were sending a harassing message, it might have been noticed by co-workers or supervisors; but they weren't noticed while sitting at their desk doing that sort of thing.

Another is a fairly well-publicized case involving Chevron out on the West Coast. Apparently, a variety of people at Chevron received pornographic e-mail from another Chevron employee. Partially as a result of that and partially as a result of some other factors, they banded together and tried to bring a class action lawsuit against Chevron for sex discrimination or sexual harassment. Chevron settled that case for somewhere around \$2 million reportedly, so it can be a significant issue for businesses.

The second issue is employee postings using the company e-mail address. If you have Internet access or access to UseNet groups, you have to be concerned that if your employees are posting messages out there, and there is some indication on the message that it comes from the company, the people out there in the world are going to interpret that as an official statement of the company — and obviously, people want to be able to control the flow of so-called official information out of their organization.

A third concern is copyright violations. There's been a lot of discussion of that today. You obviously don't want your employees downloading, copying and distributing copyrighted materials in violation of the copyright laws across your e-mail system. You don't want to be caught in a situation where somebody argues that you somehow facilitated a violation of the copyright laws. That's really the same concern that system providers have, and the final concern is the theft of trade secrets.

There have been a few well publicized cases where employees have taken company trade secrets and e-mailed them surreptitiously to competitors. There is one involving Borland

that some of you may have heard of, where apparently an employee of Borland allegedly sent some trade secrets of Borland to Symantec two weeks or so before leaving Symantec for a permanent position. So you want to kind of keep control perhaps on this sort of thing.

What all this boils down to is that if you're going to use e-mail on any kind of enterprise-wide basis, you ought to have a policy on how you deal with e-mail. I don't think I'm going to get into the details of the policy. If you look at the written materials of the CD-ROM, you'll see a series of guidelines. You'll also see some sort of a much more extensive discussion of the kind of things that you want to think about in formulating a policy. But I do recommend that if you have an organization that is making extensive use of e-mail, that you have a policy. It's the only way really to protect you against various kinds of claims that I've talked about, and perhaps to prevent those types of claims. It's relatively painless, and I think that the article in there should be helpful in implementing that kind of a policy.

One of the issues that naturally flows out of the policy — and I'm not going to spend a lot of time on this either, although you'll see a discussion in there — is whether or not to monitor your user's e-mail.

It is an incredibly controversial topic in legal-political Internet circles all over. For me the issue is not really whether or not you do it — because I think you have to make that as a business judgment, an organizational judgment — but you should be aware that there are certain legal constraints on what you can and can't do. Those arrived primarily under [inaudible], although they may arise under state law. If you look at the written materials, you'll see an extensive discussion of that.

With respect to the state laws, as Lance Rose talked about in the last presentation, there's a “blue sky” issue. State laws are going to vary from jurisdiction to jurisdiction, and you're really going to have to consult with somebody and kind of clear your e-mail policy on monitoring through all of those laws before you go about implementing it. But the bottom line is there are issues you should be aware of with e-mail. You should take care of it with a policy, and you ought to think about what you do with the policy, communicate it to your users, and stick to it.

For the last few minutes of the session, I'm just going to quickly run through some of the emerging issues and the emerging uses. This is not an exhaustive list, but it's an example of things that are going on, that people are thinking about.

The first one is jurisdiction. Where can I be sued and what law is applied? I wish I could give you answers to those questions, but it is very unsettled right now. I think that generally if you're doing these things, you're not going to be able to be sued in every state of the Union if you don't have a physical presence there, or by the simple fact that you have telepresence. But again, I think this is an evolving area, and nobody's really sure where this is going to come out.

Intellectual property rights; those are significant issues with respect to trademark and copyright. I would suggest to everybody if they've got any concerns in this area, they should consult people in that area.

Specifically, one of the issues that is coming up right now are the domain names; and a lot of these issues were touched on earlier today, and I'm not going to go through them again.

The content responsibility, again, has been touched on earlier today. If you are putting content on the Net, who's responsible, the provider or the systems operator? Again, there are decisions that go both ways on that, and it's far from being settled right now.

Some of the other emerging issues that are coming up are in gambling. Some people may have seen that you can now do gambling on the Net, either with fake money or with real money. I think that there's a variety of issues that; to me, it's fairly clear that it's illegal activity in many states of the Union, and the fact that you're doing it is probably going to be — it's probably violating some criminal statute.

Maybe the more interesting question is that there probably will be a jurisdiction — like the Cayman Islands, or some other jurisdiction — that will become the host to all these operations, and they will essentially be immune from any type of claim. And even if you were able to make a claim against them, I would suspect that because they're probably not monitored, and you think you were ripped off in some way, that on public policy grounds, because you were conducting an either illegal or socially inappropriate activity, that courts would not allow you to enforce that if you had somebody to enforce it against.

The next issue is tobacco and liquor advertising. There is an open question right now; some tobacco companies have put up Web sites or are contemplating putting up Web sites. There is an open issue as to whether or not FCC law, which prohibits them from advertising over the telephone system, is going to take jurisdiction over the Internet. They have not done so yet, but there's a possibility of that. Again, that will be fleshed out more.

“Cyberbanking,” and digital cash... The first Internet bank has opened up, and it is able to take deposits. It's going to be interesting to see how it does. The more important issues that you have in that area is with respect to digital cash, and the ability to evade taxing authorities. I think that that's really the principal concern. There's probably significant uses for either money-laundering or evading taxes, and there will be, I believe, a lot of issues there that will be fleshed out in the near future.

With respect to securities laws, you're seeing more and more purported scams that are going over the Internet. The activity is probably no different than what goes on in everyday life, it's just that the media is much more attracted to it because it has an Internet side to it. From a regulatory point of view the SEC has recently issued a ruling that provides that the terms and conditions under which the electronic delivery of a prospectus occurs is acceptable behavior. Again, the SEC is one of the agencies that's really sort of moving towards a paperless society, and they are adopting rules that would allow for that.

One of the big issues for anybody who's doing business on the Internet is collection of sales taxes. Right now the existing laws with respect to that are, if the analogy is going to be mail-order companies, that unless you have a physical presence you're not liable for collecting sales taxes on your transactions. I suspect that as the states and the federal government are scrambling for more and more revenue dollars, that those rulings are going to be revisited; and I don't know if it's going to be retroactive or not, but I will be very surprised if you don't see legislation in that area in the near future that is going to allow that to be picked up.

The last issue is FTC regulation. In April of this year, the FTC basically indicated that they had a task force started that was going to start investigating consumer fraud and other things going over the Internet. Again, I think it's just a movement towards more and more regulation on the Internet, something that many of you long-time on-line users are not going to be used to.

That's it for the formal part of our presentation. If anybody has any questions, I would be happy to take them.

M: [inaudible]

Wayne Martino: There's supposed to be a CD-ROM of the materials? Correct. They are supposed to be provided to all attendees, and that should have our materials on there. Yes.

M: [inaudible]

Wayne Martino: Absolutely. It's a very good question. The question is whether or not there are international aspects of jurisdiction — and I was not trying to suggest that it's just a U.S. issue,

because you can operate anywhere in the world. You're absolutely correct. There are very different laws with respect to First Amendment.

The First Amendment protection that U.S. citizens take for granted doesn't exist in any other countries, and similarly, with respect to copyright, the U.S. protections are going to be very different. You can also have circumstances — in the trademark area, for example — where you could have a company that has a trademark on the name “ McDonald's” in Belgium, and someone who has it in Italy, and someone who has it in the United States, and if they all are operating on the Net, who's going to have responsibility? There's no doubt that the international aspects of this are considerable, and I think that it'll probably be a long time before you're going to see treaties that are going to be adopted, if ever, that are going to take care of a lot of these issues. Yes.

M: [inaudible]

Wayne Martino: Sure, the e-mail address is w.martino@callnet.com. Anybody else? We have our last session of the day, which is going to begin at 4:15, on “ Structuring Strategic Transactions,” and we look forward to seeing you there. Thank you.

INTERNET LEGAL STRUCTURING STRATEGIC TRANSACTIONS



SPEAKERS

Wayne Martino, Esq., P.C.
Brenner, Saltzman & Wallman
Newton Brenner, Esq.
Brenner, Saltzman & Wallman

Wayne Martino: Why don't we get started? What we're talking about is the structuring of strategic transactions. My name is Wayne Martino. My partner Newton Brenner is here, and maybe we're a good example of a strategic relationship.

Generally, strategic relationships are between larger, established companies and smaller, emergent companies. They have a variety of names, from strategic alliances to corporate partnering, and probably what type of transaction it is is only limited by the names the parties can attach to it. As the definition shows, it is a collaborative relationship which helps each party leverage their existing resources to achieve a strategic business objective. Generally this involves the alignment of technological innovation, organizational resources, management expertise and entrepreneurial ability. Companies may enter into a number of strategic alliances. It is not limited to one. They may also do it with one product.

Today, you'll hear Newton or I refer to different companies in different circumstances where we have encountered strategic alliances. One that we'll refer to is a medical — a software company that has developed a computerized medical record, and we'll be talking about some strategic alliances that they could look at. Obviously, this is a hypothetical case.

Probably the most critical element here in choosing the strategic partner, and I can't emphasize this enough, is who the partner is going to be. And if you don't have a good partner and you haven't identified why you're entering into the relationship, why both parties are entering the relationship, the possibility of success or failure is clearly going to be magnified. And I think there are five areas that you should look at.

The first is the compatibility of the goals. Do you both expect — do you both want to go in the same direction? Do you both have mutual incentives? If it's a one-sided relationship, and if this is supposed to be collaborative, it probably is not going to work. Both parties have to get significant benefits out of it. Is there a mutual commitment? Do both parties want to do this? At what level of organization are they committed to doing this project? Are they doing this project simply because they think it's a good idea, or is it really part of their strategic plan? How responsive is the other side going to be? Again, this is very critical when you're dealing with large companies, in that you've got to make sure that you hopefully have a champion who's at a significant level on the other side who will devote potentially some career capital to make this happen.

Generally you're always going to have development problems that will be encountered, and you need to be able to deal with those quickly. And if people are not going to be able to deal with them quickly and they're going to delay them to the extent that there's technological innovation as part of that, you're probably going to lose it. And the last concept is longevity. How long is the project going to take? Do both parties expect it to occur at the same time?

Newton Brenner: Wayne, the one thing I just might add, which maybe overrides all of these, is realism. That is, you've got to be realistic in what you can contribute in terms of whether you're the big company or the small company. The other guy has to be realistic, too, because if you just undertake this as hubris and showmanship and exaggerate what you think you're able

to do, it will crash very quickly. These partners are meant to live together and you're really got to think through what you can commit to and also what the other guy can commit to.

Wayne Martino: The next area is, why do people get into it? What are the advantages? Well, the advantages to the established company are numerous ones. They can leverage their existing resources. There may be a circumstance where they have a great marketing and distribution facility, but they don't really have the products to put them in. For the small company, it could be the exact opposite; they may not have that. So the large company is probably trying to leverage a resource that they have to their advantage. They may be looking to expand or maintain their market presence.

Again, it may be a question of technological innovation. They may not have the products. They maybe want to fill out their product lines and reduce the risk of product obsolescence, so that they will consider entering into this relationship.

There is also the lower cost of development. Lower labor cost and lower overhead are the hallmark of small companies. They can do things on a much cheaper basis because a lot of them are working for subsistence level, because they hope that plays in the long-term equity and not on a dollar per dollar salary.

The next is the access to entrepreneurial acumen. Smaller companies are generally probably a better incubator for entrepreneurial activities, and larger companies will look to and hopefully get some cross-pollination with their existing workers. Also, I think that that's important because generally the smaller companies are not going to be sort of constrained by the views of the larger companies. Larger companies may have a methodology that they teach people — "This is the way that we do things," and do not necessarily want you to explore other ways. It may be helpful for them to see a different perspective.

The next item is the speed of technological innovation. Again, smaller companies may be closer to the marketplace than a larger company and you may need to do that. Combined with that is whether you want to keep this from your competitors or not, and that may be another reason to do this.

Additionally, there is the financial upside. What you'll see in these relationships more and more is an equity component. A few years ago, or more than a few years ago, the equity component wasn't always included in the deal. We'll be talking about that, because it's become a very significant element. Most of the larger companies are looking to participate in the success of the smaller company because they believe that they are contributing to it. Going along those same lines, in many circumstances they look at the transaction as a low risk acquisition candidate. This will give them an opportunity to do a sort of due — not legal diligence, but a business diligence that will allow them to really understand the company and the people and determine whether or not they want to make an acquisition. They can probably get it at a lower value because they already own a piece of it.

The advantages to the emerging company: I think the most critical one is validation. Aligning yourself with a larger company who's in the same industry or in a complimentary industry can be a validation of your technology or your product. It will carry you a long way to being able to raise money from additional investors, if that's one of your goals, and from venture capitalists, and from going public. What you will see with many emerging companies is that they will look for somebody to say, "This is good technology and we've bought it," because then they will be able to go to their customers and everybody else with that. And that is probably the critical element that you have to look at in terms of the benefits to the smaller company, because they will be able to leverage that substantially.

The second point is the ability to focus on their core capabilities. The smaller company may not be interested in focusing on product or distribution; they may simply want to be a

developer and they'll let somebody else do it. In the medical company that we mentioned as a hypothetical, for example, they may say, "Look, we just want to be a developer. We don't want to have a fully integrated operation, because what's critical to us is that we have an ability to quickly develop our product. If I've got to think about creating a fully integrated company, it's going to slow me down." So you might want to think about strategic relationships with somebody who, for example, might be a reseller or who could provide you with other benefits.

The next item is the access to experienced managers. This is probably both a positive and negative. Whether or not their experiences are good or bad, they've been through a lot of the things that the smaller company is going to face, and there is a significant benefit that you can derive from that.

The last two items are access to mature distribution channels and broad market exposure. Again, they may have an ability to get to markets that you can't get to because you're small, or because there may be a credibility issue. A larger company may have contacts that a smaller company just can't get to.

The last one is a lower-cost financing alternative. To the extent that the choices are between venture capital money or doing a strategic alliance, if you're getting the money from somebody who's doing a strategic alliance the primary focus of the large company is not usually on the financial side of it. So you're probably going to get a better valuation from them.

Newton Brenner: One of the things that you tend to see is almost a redefinition of corporate development. Many of the small companies never developed into an integrated business, but rather function as an R&D shop. It is likely that this hypothetical company that Wayne is talking about will never achieve its own marketing system. It may never achieve its own manufacturing system. What we see emerging in the very near future may be corporate development experts at companies that are going to be undertaking very little corporate development. At the same time [you will see] experts in the larger companies that are going to be used to fitting in and fulfilling those possibilities.

Wayne Martino: The next is the risk to the established company. One of the obvious ones is the market risk. Are they aligning themselves with the right people? If the program does not work out, are they going to be behind the development curve and not be able to do this product innovation themselves? There is obviously a financial risk to the extent that the project is not successful.

The risks to the emerging company can be substantial. One is the loss of independence. All of a sudden many of these emerging companies are — a lot of the individuals are expatriates from large companies because they didn't want to live in a corporate culture. All of a sudden they realized that to do this alliance, that there are certain concessions that they are going to have to make. Those concessions may be in where the product goes, because there may be a different financial or product agenda, a product development agenda that the large company has.

One of the things that you need to think about — and there are no really clear answers, but it's a situation that we've encountered numbers of times — is what happens if there is a loss of direction or focus, or a change in executive personnel in a large company? That is a very significant issue. It happens probably more often than not, where companies will get into projects and for some reason or another they will not want to continue them.

And the question is, how do you extricate yourself from that situation? Have you built in mechanisms to do that? It is a very, very troublesome area, and many people do not deal with it up front because it's so difficult to do, both politically as well as from an agreement point of view. But it is a very critical element.

The next item is the loss of an entrepreneurial or technological advantage. To the extent that the strategic relationship involves giving up part of the distribution or the marketing of the product, you're going to have some problems in that area with respect to how you are proceeding.

In addition, your technological advantage may be one of speed to the marketplace. You need to get there. To the extent that you've got a large company that has an organizational structure, it takes a long time to make decisions, in terms of not only going forward with a strategic alliance, but dealing with changes in development or things of that nature. If that results in delay and compromise, the innovation and the technological advantage that you had may be lost.

The next item is customer isolation. If you are giving the distribution to somebody else you may be removed from the customer. That may have been the genesis of your advantage when you got involved with the product, and you need to think about [the alliance] in that respect.

The next item is the risk of piracy, of proprietary confidential information or employees. Generally, you'll deal with this from a contractual point of view and you will have limitations on that. You will prohibit them from soliciting your employees; you'll have agreements that say that they can't use your technology. The important point here is not, "Do I have agreements there?" If it happens, what you've got to understand is that the large company is going to have much more significant resources than you, if you're a small company, to fight that type of behavior.

One of the situations I was involved with was a large company where they had taken the technology and put it in a subsidiary in a foreign country and were developing it there. Luckily, we found out about it and it ended up resulting in the termination of the relationship. But the prospect for my client of trying to enforce that, even if they were right, was going to be very expensive and very time-consuming. To the extent that you are dealing with technical innovation, you may lose your market advantage there and what you simply say is, "Look, I don't want to be in the business of litigation, I want to develop." But you've got to realize that's a significant risk.

And the last item is an unfavorable future evaluation. You may be selling the equity too cheap to the large company if they want to make an acquisition. You may fail to diversify your products because they want you to go in one development area and not to be fully integrated.

Newton Brenner: Wayne, I just want to emphasize again the point that you've made very strongly, which was that you've got to look at the people, at the time you're making this deal, as people who are sitting at the desk across from you; but you've also got to realize — and it's critically important that you realize — that you are making a deal with a file. In the course of the six months or eighteen months or two or three years that it takes to fulfill any of these development functions, there is a good chance that the leader on the other side may change. What he's committing to do for you, because he sat across the desk and promised you that their company was behind him, may not be in the file, may not be documented, may not be part of the agreement. Someone else may have taken over the chair, and the enterprise may have some new risks. The new guy running it may be able to write it off as being the prior guy's mistake. You've got tremendous issues of corporate politics that you've got to be aware of when you sit down and make one of these deals.

So make sure that you're working your deal out not only face-to-face, but also make sure that what you need to protect yourself has been appropriately documented and the file supports it.

Wayne Martino: Now that we've talked about the advantages and the disadvantages, let's talk about what the structuring variables are.

The most important thing is the objectives of the parties. In determining how the structure is going to be, you're going to look at a variety of different areas.

The first is going to be the strengths and weaknesses of the parties. That may be from the different perspectives of marketing, from distribution, from technological innovation, from manufacturing. What you want to do is to leverage. Each company should hopefully be leveraging their strong points and hiding their weak points.

The next issue is, what's the desired relationship? Again, if people are looking at this as the first step to an acquisition, the structure could be very different than if they are looking at it to say, "I need product or I need distribution and I'm going to move in that area."

The next item is the type of technology or product involved in this stage of development. There may be different relationships that are established depending on how close something is to the market, and that will result in different structures. The target market and the distribution method again will indicate to the parties what the type of relationship should be.

The ultimate ownership of the technology — again this is a structuring in terms of equity, whether it's going to be in a subsidiary in a joint venture — but who at the end of this process is going to own this technology? It's something that needs to be identified and to the extent that one party owns it, is the other party going to have some co-exploitation rights or some exclusive market opportunities that they may be able to exploit?

And the last item is the expected reward for a successful development. If this thing works as everybody hopes it's going to work, what are people going to get out of it? Is it going to be an equity play? Is it going to be just manufacturing? Is it going to be additional product development, additional relationships?

I've indicated four types of structures. There's obviously also different relationships that you can have in terms of the business relationship, but I think that they generally boil down into four, maybe five if you include distribution. Let me just quickly run through them.

The first is a joint venture relationship. That's an association where two companies will generally take products and capital and other facilities and put them into a new entity in which there will be joint ownership and control, and they will share in profits and losses.

The next type is a product development agreement. That is an agreement where one party will generally fund the development of a product for their use or for some co-exploitation for some period of time. The funding in this area is usually based on the satisfaction of milestones.

The next area is technology exchanges. The companies may have complementary technologies, an "I'll give you yours if you'll give me mine" type of relationship, and that can be the basis for a successful relationship.

The last one is listed as licensing, the granting of authority to use or exploit some core technology or product. Again, this may involve co-exploitation rights or some defined market opportunities in which the licensing can occur.

The next item is equity participation structures and again, there's lots of variations on this. I've just identified four of them that generally come up. The first is common stock or common equity, where there's a straight percentage in ownership and sharing in profits and loss and success and failure.

The next is preferred stock or preferred relationship. When I'm talking about stock or equity — and we'll talk about this more later in terms of structures — I'm not suggesting to you that it has to be in a corporate structure. There may be partnership structures that you might want to consider, and we'll be getting into those. But the preferred relationship would

generally involve some preferential return of capital or payment of dividends before the non-funding company received any distributions. Incorporated with that may be some conversion into some common stock or common equity so that they can participate in the equity growth of the company.

The next item is a convertible security. It can take a lot of forms. Generally, this is a security that's going to be convertible into equity in one form or another. It can be in the form of notes or convertible debentures, things of that nature.

The last items are warrants and options. These are rights to participate in the equity growth through a right to acquire stock or an equity interest at some period in time. It may be at favorable prices, it may be at today's market price. It may be at a market price that is higher than today's, but it's not a direct equity investment. It's a mechanism that many companies will use so that they have the right to tie into a valuation on a company today, but they are not going to take some of the risks from a financial statement point of view that are associated with having an interest today.

The next items that I'll quickly run through are some alternatives to equity participation. For owners of small companies, absolutely the last thing they want to do is to give up [inaudible]. They will fight and claw to limit the points. They will look for as many different ways and as many different structures as they can to try not to give up equities. I've listed a few here. Generally, to the extent that they need funding, you can look for advanced payments, large up-front payments that are going to fund development for some period of time or that will allow them to exploit some market opportunity. Again, this is an alternative to a equity component.

There may be R&D funding. They may say, "You fund the development of this. We'll pay them on a monthly or on a quarterly basis based on budget and based on establishment of milestones instead of you taking equity." You may ask for loans from the large company. You may look for guarantees to third parties for either provision of loans or the provision of facilities. And again, I think that sometimes large companies are receptive to these types of structures. You may look for favorable leasing terms for facilities that may otherwise be dormant, or on equipment. There's a possibility that you can get personnel loaned to you.

There are some complicated issues here in terms of whose employee the individual is at the end. What type of relationship do you have regarding confidential information and proprietary information? But they may have employees that are either excess or that are dedicated to certain projects that they may want to provide.

Another area in which they can help is to do a market research study for you. Again, these are "off the balance sheet" items that they may be able to do. The last is to be a beta site which they are probably very interested in, if it's in the software area, so that they know how the product development is going.

Newton Brenner: Wayne, sometimes the list that you've given for the alternatives may be preliminary, and gives both the small company and large company a way to get started.

At the early stages the nature of development may be so indefinite that they can't really put a price on it that would be fair to either party on any equity participation. But we've seen all of these techniques that Wayne talked about operate. Many of the large companies are familiar with them and are able to function with some of these without demanding equity participation in every deal from the inception.

Wayne Martino: The next item that we're going to focus on is, what are the major issues? What things do you see that come up all the time that need to be defined in the agreements or in the relationship? And this is not exhaustive; again, this is just a checklist of the things that you

should start thinking about as you're thinking about whether you want to enter into a relationship and what it will mean.

The first one is critical. They're all critical, but the first one, the rise to technology, is something that you need to very clearly delineate: the ownership and licensing rights to the core technology as well as to the enhanced or improved products. Part of that also will generally include an affirmation of the technology owner's rights to use it in unrelated activities outside of this venture. I can't stress upon you the importance of that enough. You don't want to contribute the technology and then say, "Oh, by the way, I've got another development project and we use it in both projects," and then you've got to go back to your partner and ask them to allow you to do that. Those are issues that you've got to identify early.

One of the other items with respect to the rise in technology is that you have to identify to what extent these technologies or practices incorporate existing technology and create issues regarding ownership. To the extent that you identify who owns the product and what rights they have, you've got to make sure that you clearly — if licenses are needed for the product that were ultimately developed from the company that has a portion of the technology that was used as the base, you need to have that.

With respect to technology, one of the things you'll also consider is any limitations on the right to work with competitors and whether or not there is going to be any post-development collaboration.

The next item is proprietary and confidential information. As I indicated earlier, generally you're going to incorporate covenants that are going to prohibit the use or disclosure of confidential information. In general you may have covenants that restrict certain activities or solicitation of employees. Those are things that you should identify early as to whether or not they are relevant. You want to make sure that the technology is well-protected, because for small companies that may be all that they have.

And you should also realize as you enter into this development program that the large company is probably going to require all of the key employees and officers from the small company to enter into nondisclosure agreements, and assignment of invention agreements. To the extent that you don't have that now, if you're a small company, it is in your interest to do that for a lot of different reasons, the most important of which is to make sure that your ownership of the technology is very clear. You don't want to end up in a situation where an employee says that they had developed this [at some point that was] not during working hours, and that you don't own it. Among other things, that can result in a delay, if there's any questions as to ownership, as to whether a company wants to get involved or not. Generally they're looking for as clean a relationship as they can, and if you're trying to sell technology and if your ownership rights are at all in question, you need to deal with that early and get it resolved.

Newton Brenner: Wayne, I think the next topics that you wanted to discuss were the major issues. In fact, Wayne, let me give you these.

Wayne Martino: All right. The next item that we'll talk about is decision-making and control. Who's going to be in day-to-day to control of the operation? To the extent that there's cross-ownership, there can be issues of day-to-day control. That generally is not the circumstance, except in joint ventures where both parties may contribute employees. You more likely will see this situation in terms of whether there are going to be rights to override decisions, unless there's unanimous decision-making with respect to certain issues as to whether or not certain deals can be done, whether it's a sale of the company, a sale of the technology or a deal with the competitor. One of the features that you will see that is used, a mechanism that's used to

do this, is generally going to be classes of stock that will allow different voting on certain matters and may allow different people to have rights to elect to the Board of Directors.

The next item that Newt and I both talked about before is what happens in changes of direction of the companies. I indicated to you that it's a very touchy area, because nobody really wants to think about it. But one of the things you need to focus on is whether or not that's a possibility, so you can create any mechanisms that will deal with that.

And I'll tell you up front that it's not easy to do, but in certain circumstances you can do it because you may need to deal with stalemates and changes in strategic direction or policies. One of the items that you may consider, if things are done at the Board of Directors level, is to have less than unanimous decision-making at the Board level.

Say, for example, that you've got six people that have to make the decision at the Board level. If it's less than unanimous — let's say that you have to have four or that you have to have five, on the theory that you've got to have at least two of the people from the other side agree to a development program — there is some possibility that you can get it. Generally, you're going to see people move in lock-step on a company basis. The one benefit that you have — and I can't tell you that it's really substantial, but I've seen it used — is to impress upon people at the Director's level that they have a fiduciary duty to the company, not necessarily to their employer. Because they're directors they have a duty of loyalty to this company, and they should not be making decisions that may not be in the economic or business interest of their company or may not be in the best interest of the company that they serve on the Board of.

The next item is the use of milestones. Milestones are — and I think Newton mentioned this before — critical. When you establish those, what it is going to do is to focus the parties on the specific goals and tasks to be accomplished, and hopefully it's going to introduce some realistic expectations in the process. One of the things you'll find out as you start the process is that certain claims may be made, certain ideas will be bandied around about where the development of this is going to go, how long is it going to take, and what we are going to do.

As you move from that stage to actually trying to document and establish what the milestones are — and these milestones may be important because they may trigger funding or they may trigger certain transfers of ownership — the parties may change considerably in what they've said in the beginning and what they're actually going to commit to. And that is a critical element because, especially with large companies, you are probably going to be analyzed against how you perform to this plan. To the extent that you don't have a realistic plan from the beginning, the relationship is probably off to a rocky start.

Also, the other thing that the milestones will allow you to do is that sometimes they will allow you, to the extent that they have not been established, to get out of a relationship before there's either a complete loss of a financial investment or a complete loss of a market opportunity.

The next item that we have is market exploitation. And generally, here I think you've got to strike a balance between the large company's objective of getting as great a share of the marketing opportunity and the marketing rights as they can with a smaller company's desire to carve out areas of permitted activity in order to maximize their market penetration. One of the major issues that you'll see here is exclusivity.

Exclusivity can be defined in a lot of different ways, from geographical territory to field of use to product linkage. It is an area in which people need to be particularly sensitive, because to the extent that they are being excluded from market opportunities they need to realize that if they've given up an exclusive, they're not going to be able to go back into that area at a later time.

The next item is manufacturing rights. In certain circumstances you may get into a situation where the manufacturing rights for the product may not be available or that the

manufacturing rights will be what the company has at the end of a development cycle. They've licensed all of the product out, but they can still build a successful model based upon their ability to retain the manufacturing rights.

The next item that we're going to go to are the equity investment issues, and they are not insubstantial. Newton, I'm sure, will liberally help along in this one.

The first one is the type of participation that you're going to have. We touched on that a little bit before in terms of whether it's going to be a common relationship or whether it's going to be a preferred relationship, or exactly what that relationship is going to be.

Newton Brenner: While there are many definitions of how you're going to structure the deal in terms of common or preferred stock, the thing I think that you'll find is most common and most fought about are the items at the end of Wayne's list.

Today, it's not a question of whether I bought common stock or I bought preferred stock; the question is, how do I get out? When do I get out? What's the term? Is there a way that I know I'm going to get my money back, or a shot at getting my money back, in three years or five years or seven years? But whether that's done because I've got the right to cause the company to go public, or cause the company to redeem my stock or cause the company to put itself on the market — those are issues that create tremendous pressure in factoring out all of the elements in the equity relationship.

The anti-dilution elements relate to [the fact that] I'm putting money in. I value the company at \$10 million even though all I've seen was a business plan and a couple of pieces of software; but if I put in \$2 million, for 20% interest in a \$10 million company, if six months from now things haven't gone in the right direction and someone puts in a million dollars for another 20%, I want the right to change my deal. I want my \$2 million to be recast into the same money structure that the new guy did. This can create tremendous friction in negotiating the relationship; but generally, if you're only redefining the relationship with anti-dilution provisions because you didn't perform in accordance with plan, you'd better be prepared from a small company point of view to face that possibility.

Wayne Martino: The next item is [inaudible] calls and redemption rights. [inaudible] and calls are obligations to either purchase or sell securities. Again, if one of the critical issues is what's the exit path for the large company making the investment, they may ask for a right to require a purchase or require a sale of their securities. There may also be, from a small company's perspective, a right to redeem the large company's shares at some point if the relationship is either going very well or very poorly. There may be opportunities to recast or take out equity partners so that the development in the companies can move forward.

The next is the tax implications, and it's really Newton's area and he'll guide us through this area.

Newton Brenner: There are a couple of points that are worth mentioning in the tax area, even though there is no question that this area of tax and accounting does not drive the structures that are put together in the corporate partnering — we've got to make it a business deal that works first.

Under the tax caption, you should understand that most of these deals in some respect recognize a significant amount of wealth in technology that is in its nascent stage. The question comes when the large company says, "We want to do this not as a loan or not as a beta site test, but we want to organize a new company with you. You put in this technology, we will put in X million dollars. The effect of the new arrangement will be that we recognize what you've done is already worth \$10 million in terms of our evaluation, but it only cost you \$500,000 to

get there.” Do you have a problem in realizing that you have a major gain just because you transfer your technology to a new entity with a financing corporate partner?

The answer is, you can do it. You can transfer technology either to a new corporation or to a new partnership without recognizing that gain, but you must be careful in doing that. There are some old revenue procedures that say the only way to do it is that you’ve got to transfer all the technology, all the elements of the invention to the new deal in order to do it tax free. That is generally not followed today. There are some private rulings, and some other materials in the world of tax law, that says you can transfer significantly less than all of the technology to a new entity and still not have to pay any gain measured by the value of the technology at the time of transfer. When you’re doing one of these new structures with a capital partner you’re going to go through issues about what kind of structure to choose.

Tax people think in terms of pass-through entities and non-pass-through entities. Pass-through entities are limited partnerships, L.L.C.s, taxes, partnerships. What they mean, generally, is that there is no separate level of tax at the entity structure. If we own this structure in a 40-60 relationship, 60% of the elements go to the 60% owner, 40% go to the 40% owner, and there’s no tax paid at the entity level.

On the other side we have a typical “C” corporation, which is a tax-paying corporation that can be owned in various ways, with common stock and preferred stock by two partner groups, or more than two groups if you have more than two participants. The entity will pay tax itself separately.

The advantage of the corporate structure is that it fits what’s called “reorganization” models. That is, if one of our favorite large corporations comes along and offers stock for this company that we’ve put together, we can take the stock in the large company on a tax-free basis. There are just a couple of things from a financial statement point of view that I want to mention to you.

Most small companies don’t have the resources and don’t have the inclination from day one to start with audited statements. If you eventually want to sell your company for stock or for cash to a company that’s a registered company on the New York Stock Exchange or on one of the other exchanges, as long as they’re registered with the SEC, there are limits on the ability of those companies to acquire your company if you do not have audited financial statements. Those limits are complicated, and they relate to size. Generally they come up when you are adding something like a 10% increment in either sales or asset size to the company that is acquiring you. If inventory is not a major factor in the operation of your business — and in many of the small companies that we see, inventory is not — you can get statements audited after the fact. But you may very well need them.

Wayne, I thought we just might talk a little about this [hypothetical] software company because I think there are some interesting hypothetical issues that may illustrate the problems at hand here. Then we’ll take some questions.

Wayne Martino: I’ll give you examples of strategic alliances that this company might consider. One of the strategic alliances may be with a hardware manufacturer. They may be going into hospitals or doctor’s offices. It may be a non-mainframe technology, maybe a PC technology that those facilities don’t have, and they may enter into a relationship where they will align themselves with a large manufacturer who will provide discounted price and will in some way resell their product for them.

They could also consider an alliance with a service provider. One of the things that this company may do is to have a medical record and, for example, let’s say that they create a host server with a large communications company that is going to be the one that maintains all of their information with respect to their customers. That company is going to be the one that’s

going to be serving it out to the same industry that may, for example, have a competitive product of theirs. But that company may have decided that this product is better and they want to add it to their repertoire of products that they have. They could consider a licensing agreement, a reselling agreement or some other relationship with them.

From a collaborative point of view, there may be companies that have certain applications that this company does not have, and it may make sense to be able to sell a whole suite of products. They may enter into different relationships with somebody that has, for example, an application. There may be a billing application; they may have a medical application, for example, that provides for recording of EKGs or provides for a recording of x-rays. They may consider doing a relationship with a company that may be doing this service so that they can provide — in addition to doing the servicing and in addition to doing the developing, they can service the product also. There are a host of different relationships that they can consider.

Before we take the questions, I'll leave you with a few thoughts about successful relationships. The relationship doesn't end once the paper, to the extent there is paper involved, has been signed.

There are a couple of things that people should think about in terms of maintaining a successful relationship. Maybe the most important is always selling the strategic logic of the relationship. We encounter this very often, the fact that parties change and you need to make sure that you have committed people on the other side. To a large extent that's going to result in continuing selling what the relationship is.

For a large company, it generally is not going to be that critical to them that the relationship be successful. To a small company it may be all that they have.

The second item is perform the plan. If you've committed to doing something, and again, you should think about this early, you better perform to plan afterwards, because that's the way that you're probably going to be evaluated.

And the last is communication. You've got to communicate with the people on the other side. To the extent that you have problems that you anticipate, an early warning on those is probably the better course of action, better than seeing if you can fix them or seeing whether or not the other side is going to be concerned about it. To the extent that people believe that you are not communicating with them and you are not telling the whole story, it can destroy the relationship of trust that is critical to this going forward.

We'll now turn it over to anybody if they have any questions. Yes.

M: [inaudible]

Wayne Martino: The question is, in the next twelve to eighteen months, what deals are going to happen in the Internet? I think that you can look to see what's happened already. You're looking at the on-line service providers entering into relationships with browser companies for browsers. You're seeing relationships between content providers; a good example of that is that some of the content providers that provided material to the on-line services like America Online or CompuServe are terminating those relationships and either putting up their own Web page or going to a new service because it's becoming available.

I think that you're going to see a lot of transactions like what Netscape has gone through, where they're going out and buying up complimentary applications so that they can broaden their market exposure. You know, it's interesting that Netscape started from nothing and is now the eighty pound gorilla in the industry.

I think that another possible relationship is, to the extent that their games are going to go on to the Internet, you may see relationships between having a game on the Internet and at the same time having a relationship with a manufacturer like Sega or Nintendo to do a non-

Internet game. And I think the industry is growing so much that you can probably go and look on any given day and see a new strategic relationship that's going to be established.

Yes, over here.

M: [inaudible]

Wayne Martino: Yes, well, in terms of being at risk — the question is, in the limitation on future valuations for the company, what does that really mean as to being a risk? To the extent that the strategic direction of the company is being dictated by the large company, they may have a different motivation as to how successful they want you to be and when they want you to be successful.

If they've acquired an equity interest with an idea that they are eventually going to acquire you, their motivation may be to bring the product to a development where they know that it's going to work and then make an acquisition of the company. What that may mean is that they may restrict you from doing deals with competitors, that you possibly could be limited not necessarily contractually, but just on where your focus is in terms of what other market opportunities you can exploit.

Small companies generally have very limited resources, and if you are spending your time trying to meet the expectations or perform to a plan with a large company, that may limit what the company does in other spheres and therefore decrease the value.

Newton Brenner: Yes, you're making a fundamental choice when you pick this partner. You're making an extremely fundamental choice, maybe as important as who the chief executive officer of the company is or who the chief technical officer of the company is. And I think what we're trying to say is you should be cognizant of that choice and the importance of that choice, in that it could radically affect the future valuation of the company.

M: [inaudible]

Wayne Martino: The question is, what are the legal risks of the large company with respect to dealing with a small company, from a marketing point of view and from a confidential information point of view? I think your concerns probably are a couple. First, the access to confidential and proprietary information, to the extent that that information is available to you; you may exploit it in other areas, and how are you going to deal with that? From the large company's perspective, are Chinese walls going to be created and are they going to be honored?

The other issue, I think, that is inherent in your question is to the extent that you're on the Board of Directors, and the question I raised before in terms of the duty of loyalty and the exploitation of market opportunities. You may have an obligation to refer those market exploitations to the small company because you are a Director, or you have some fiduciary relationship that has been created by virtue of having the relationship with a small company.

Newton Brenner: Some of the confusion that emerges when you're dealing with a company that — your company may have twenty or thirty or fifty employees. You could be dealing with a company with 25,000 employees on the large side.

We had a situation in which the technology that we were trying to make a corporate partnership with was an offshoot of circuit board technology. It turned out that we were delayed for weeks because the large company had a division that was 2,000 miles away, and in that division they had certain technical ways of dealing with photo finishings. And the photo

finishing compounds somehow were within — we thought they were pretty far apart. They thought that they were close and they couldn't tell us whether they were or were not close. We were paralyzed until it got straightened out that this could be done without violating the proprietary and other elements that they have in their photo finishing division.

Wayne Martino: Any other questions?

M: [inaudible]

Wayne Martino: Well, there are some industry publications that I think that you can look at in terms of what's going on. Without giving too much of a plug to Mecklermedia, if you look at the Meckler Web site, you will find there is a site called... I'm trying to remember the name. If you go into their Home Page, you're going to find a site that's devoted exclusively to Internet information and Internet business deals that are going on. And if you click through that and if you click through the last two to three months of postings to that area, you will find a lot of information about the deals that are going on.

And I think that is very helpful to you not only to understand what is going on in the industry, but also to think about it from a different perspective. Look to see what other people are doing. You may not want to do the same thing, but it may trigger in your mind a relationship that may be able to be established. It may not only do that, it may provide you with the names of people, because they may be included in the news stories of people that are active in the industry. Maybe they're venture capital people, maybe they're business development people.

If you're looking for large companies to establish relationships with, many large companies have business development units. Their sole role is to go out and look for strategic relationships and strategic acquisitions. And if you can find a list of resources of those through newspaper articles or through surfing around in different Web sites, I think that that would be a good place to start.

Yes?

M: My company recently was recently acquired. I was director of the company, and still am, and I [inaudible].

Wayne Martino: Are you still an employee?

M: Yes.

Wayne Martino: Well, the question is, to the extent that you are entering into a relationship or a relationship has already been established, what ownership are you going to have in things that you may have developed, and [the things] you may develop in the future? The absence of an agreement doesn't mean that whatever you owned or whatever was developed is not owned by the company.

What the agreement does is clarify that issue so that there's no confusion over ownership rights. To the extent that what you have developed, clear is the right word; but if it is within the scope of your employment, then the likelihood is that you have developed it while you were working for them and therefore they own it. To the extent that you believe that there are certain opportunities... What a lot of people will do is market opportunities that may be outside of the scope of their employment. They may do them in the evening, they may do other things. You need to clearly identify that.

The best way to do that is to have an agreement with them. You may not want to do that for political reasons, because it may not look good that you're doing something on the side. They may want to exploit it. They may not want you to spend your time doing that.

The other way that you can do it is to document when you did it, what you did and clearly identify it so that you have a track record that you can rely upon in the future. Because you've got to understand that what's important is not only what their rights are and what your rights are; if you're going to go and try to exploit this somewhere else, either through a new company or through a new relationship, the same type of issues that were created with respect to the ownership are going to be the same issues that you're going to face. Whoever you're going to enter into a relationship with may say, "I don't know that he clearly owns this technology." If there's a question, they may say, "I'm not sure that I want to exploit this opportunity until you get that cleaned up."

OK. I'd like to thank everybody for coming. That's the end of the day and have a good time at the show. Thanks.

WORLDWIDE WEB ESTABLISHING A WEB SITE : BUILD, BUY OR LEASE



SPEAKER

Matthew Cutler

Director of Business Development, net.Genesis Corporation

Matthew Cutler: . . . for network access, your available bandwidth options range all the way from 14.4KB per second over a simple dial-up line on a modem to 45 megabits per second over a T-3, which is generally overkill.

For a commercial Web site, the minimum/maximum need is a continuous connect. You need a Web site to be available all the time; having it over some sort of intermittent connection won't do when people are connecting from all around the world. Also, pretty much a minimum is 56KB. Generally the minimum these days is even probably less than that. It will rarely suffice as an introductory step; you can get 56KB out of an ISDN connection today, frame relay, etcetera. But these days more and more companies are moving towards a preferred T-1 connection and that's a bandwidth with 1.54MBs.

T-1s are very expensive, unfortunately, and there's a couple of options that you can exploit to help ease that cost. One is a fractional T-1, where you actually get a full T-1 installed, but you only use it in increments. You start out at 128K, and then as you need more bandwidth, if you need to go to 256K, your Internet service provider can flip a switch and you're ready to go.

What's also even more attractive than that is a burstable T-1, and for that at any one time you need to have full T-1 access, but it's metered. So if you, on average over a month, use 256K of your full T-1, then that's all you pay for. Providers of the burstable T-1 are Advantis or UseNet, and many of the others are beginning to provide that service as well. It's technically a little bit more complicated, but is very cost-effective and very high-performing.

For Internet service providers, you can choose them on a number of different criteria, like provider reach. There are national and even international Internet service providers, such as NETCOM; regional ones like NearNet, provided by BBN; or local such as [inaudible] over in Walton. Incidentally, all three of these are here at the trade show floor, so you can go over and pick their brains if you feel that's necessary.

They vary quite widely in terms of pricing; not only how much they cost, but their pricing structure — how they're going to charge you and what they're going to charge you for install. It's oftentimes very, very difficult to compare apples to oranges because they don't line up one-to-one. It's not like buying a pack of cigarettes where you can just figure out this one's \$2.19, and this one's \$3.00 — I know which one's cheaper. It's unfortunately not that easy.

They also vary quite widely in terms of service, not only in how well they respond in terms of customer service but how often their network goes down and how long it goes down for. NearNet, through BBN, is one of the top-performing Internet service providers in the country. When their network goes down — and all networks do go down — it's usually measured on the order of seconds or minutes, whereas with some other very large national service providers whole sections of the country could be out for days. And it helps to know their track record, to talk to people who have used their services and see what they have to say.

They also vary quite widely in terms of performance, to many people's surprise. When you talk about a T-1 — I threw the term "T-1" out before — you sort of throw it around like a commodity. A T-1's a T-1, right? Well no, not really, unfortunately. There is much more to know and much more going on that determines how fast your Internet connection will be.

The first one is available bandwidth. Oftentimes, with some of the smaller service

providers, what they'll do is they'll resell T-1 access off of a T-1, so they'll have a big pipe coming in and then multiple same-size pipes going out of that one node. So you can see that that's a very real bottleneck. At peak traffic times, there's not going to be enough bandwidth for everyone to use, and your actual available bandwidth will be much lower.

It helps to know a little bit about their network; probably the most important fact is latency, and it's best illustrated by the classic hacker 747 example. Latency is a measure of how long it takes your information to get from point A to point B. Now, when you're talking about T-1 and talking about bandwidth, that's how much information you can fit in the pipe. It's sort of a measure of fullness, I guess. But that's only how much information; it's equally important [to know] how fast that information can travel through the pipe.

The example 747 is: you can take a 747 from Logan Airport — whichever direction it is from here — stuff it full of magnetic tape backup tapes, about eight gigabytes on a little thing this big, and fly that from Boston to L.A. Now, you've just moved an incredible amount of information on these magnetic tapes, all the way across the country. The bandwidth of this 747 is huge, terabytes upon terabytes; however, to get one piece of information from a computer here onto that plane to L.A. and onto a computer over there, it takes forever. Even with a bandwidth that's huge, the latency is very, very long, so it's not an effective means of data transport.

It's important to understand what latency means because, of course, Internet service providers vary quite widely in terms of their latency statistics. Over at one Internet service provider that we were doing some consulting from several years ago, it took as long for information to get from our office to about 40 miles away — full T-1 and back — as it did to get to South Africa and back, over two trans-ocean links. So it can count.

We also have the issue of packet loss. Packet loss on the Internet works in terms of discrete chunks of information, individual packets that the information gets sent out on. And every now and then, due to a number of reasons, the packets will just get dropped. The protocol can handle that; they get resent, etcetera. But if you're seeing lots of packet loss, a lot of the information that you're sending out is not getting to where it's [supposed to be] going.

That same Internet provider that I just mentioned would experience extended periods of 30% packet loss. That's three out of ten packets getting dropped on the floor, and that's 30% off your T-1 right from the get-go. So these things start adding up.

And then finally, [there is] routing. The way the Internet works is that computers can route the information very effectively. You obviously want the fewest number of hops as possible. If I'm going from my computer here to the computers in the trade show, I don't want to be going through mainland China in order to do it. It's technically feasible, and may be desirable in very specific situations, but in general you want as efficient means of data transport as possible. In general, the routing figures for most providers are pretty consistent and pretty well-performing, but it pays to ask about that. When it comes to routing, if you're going through a company like IBM, where they have their National Backbone, you can send your data out but it will make two hops, get on their T-3 backbone and make two more hops. [It can] be all the way across the country in maybe four more hops, and then make two more hops and get to its destinations. So that can speed your data access as well.

Moving on to most computer hardware.... First of all, [are there] any questions about ISPs? I realize I'm going very, very quickly.

M: [inaudible]

Matthew Cutler: Sorry for the delay.

M: [inaudible]

Matthew Cutler: The question was, "Do all providers publish these numbers?" Unfortunately, no. Providers, in general, would like to have you think that a T-I's a T-I and that it all comes down to pricing, etcetera. The better ones like [inaudible] won't do that, but some of the other ones certainly will. That's why it's important to understand some of those issues so that you can ask the tough questions; and when you hear these things get thrown out, you know a little bit about what they mean.

What is worthwhile and what we've been working on for a little while — it's just a matter of getting time to do it — is to publish a paper that explains these in layman's terms and also do some data-gathering on the Internet. We have some technology that can do that, that can publish BBN's routing statistics over the past six months so you could go to a site and do that. To the best of my knowledge, it does not exist right now.

M: [inaudible]

Matthew Cutler: The question was, "Will I include some of these pointers at the end?" What I'll do is provide these slides on our Web site a little bit after the end of the show so that you guys can get to it there. But [it's] too much content to go through. I have lots of nuggets like that.

M: [inaudible]

Matthew Cutler: The question is, "Is this presentation presupposing that the Web site will be internal, located on a corporation site as opposed to external on an ISP site?" [We're] in the build section of the talk right now, all the issues are building, buying, etc., but what you can often do is buy our own Web server, build it up, and then just locate it someplace else, even though you own the physical box. So it's a little bit of a combination of both. It's worthwhile to understand.

M: [inaudible]

Matthew Cutler: The question was, "Are there reliable service providers in Southern Africa?" To the best of my knowledge, absolutely not, but that is not very extensive knowledge. I do know that for a long time there was a single Internet host on all of the continent of Africa, and it was served by a 96KB per second dial-in line. So Africa was not very well connected, unfortunately.

M: [inaudible]

Matthew Cutler: No, I'm not sure. The best place, in general, if you're looking for more information on a question like that is to look on-line; to go on the Web and see what you can find out. I know there are a lot of resources on Africa and Africa's Internet connection out there. Sorry.

Moving right along to the host computer hardware, this is the physical computer which actually stores your information, serves your Web requests, and will be connected to the Internet. Virtually every platform has Web service available for Macintosh, UNIX, Windows, Windows NT, Windows 95 — so you can publish off just about anything. However, different platforms will provide different degrees of access and different degrees of suitability for doing your Web server.

One issue which is becoming less and less of an issue today is software availability. For a long time all the key Internet software would first be published for UNIX, then for Windows, then for Macintosh — mainly because most of this technology was originally created on UNIX machines. But due to the market forces in play right now, you'll see a lot of new technology that's only available for Windows NT or simultaneous releases, etcetera. [Inaudible] is a company that supports both UNIX and Windows NT for the following reason of stability: it's very, very important to have your Web server available all the time, but if your hardware platform isn't stable and is crashing...

I'm running Windows 95 right here, which I have lots of horror stories to tell about. If your fundamental operating system or hardware platform isn't stable and is going to fall over very regularly, obviously you won't be able to serve your Web requests, so you need a stable operating system. Today that means Windows NT and UNIX. Windows NT is becoming more and more popular as a Web server, but it's yet to be proven in my experience as a very high-load, high-traffic, highly-secure server platform. Due to its current growth, though, I expect that to be established relatively soon.

The issue of performance. Interestingly enough, Web servers generally are not very processor-intensive. So if you get a Pentium system, you know it's not necessarily going to translate into super, super fast response times from your Web server. If you're doing large database [inaudible] where you're doing a lot of processor-intensive stuff behind the Web server, then it can count. But the key factor for terms of hardware performance is going to be in physical memory. Every time you get a Web connection it occupies some RAM space, so the more memory you have the more simultaneous requests you can get going. In general, the bare minimum is 16 megabytes of memory, but really 32 is the baseline. Our [inaudible] right now is at 64. It can get pretty unhappy at peak load times as well, so we probably need to get more.

We also have the issue, a lot of times, of dedication, where you just invested in this great unit's workstation. So, can we use it for anything else? Well, of course, that depends — as with everything here — on one [thing], how much traffic you're getting. If your server is just getting hit a couple times a day, then yes, you have a lot of spare clock cycles around. It depends on the power of the Web server. A lot of it depends on what else you're going to be using it for. Running mission-critical applications or very, very sensitive applications on the same machine that your Web server is running on is probably not a good idea. So it's a mix of a few things going on there. But in general, if you don't have a lot of load on your Web server and you have some other processes which aren't too sensitive running there, that should be fine.

For your Web server software, this is what actually serves your user requests. It's a small program or large program, depending on which one you have, that takes the incoming requests and says, "Oh, okay, I know what language you're speaking. You want the following document. Yes, you have permission to get it." [Then it] grabs the document and sends it back out the door. Again, most platforms are supported. The key consideration here is performance. How fast can this Web server handle requests? And how stable is it? How stable is the program itself under high-loads? Oftentimes it's a trade-off between performance and stability in terms of system requirements.

You may have a Web server that's very, very fast, but each connection requires a lot of RAM. So in order to run this thing effectively, you need a more higher-end workstation to do it. Or it's very, very stable, but it's very, very slow. So there's a lot of companies out there that you can see on the trade show floor that will promise the best of both worlds. It's generally important to talk to other people who are using them. Go out on UseNet, that's a good forum; [inaudible] Infosystems, the World-Wide Web — there's a whole bunch of them underneath there where people will talk about their experiences with Web service.

Commercial servers. For a long time the only servers available were [inaudible], the two

main ones each with their pros and cons. Today there's another very popular public domain Web server called Apache, which is an update to the NCSA code. That's what we're currently using internally. There's a number of commercial servers out on the market right now, and there's probably at least a dozen that are being shown on the trade show floor today. Features of those include user authentication, the ability to do secure transactions — which has entirely its own set of issues there — as well as some information processing.

Some of them have interesting database times, etcetera. Provider examples of that include Netscape, of course, with their commerce and communication server; Open Market with their servers, which incidentally only run on UNIX; and O'Reilly's WebSite . Our products support Windows NT, so we do a lot of testing on Windows NT servers; and O'Reilly's WebSite Web server is by far the best-performing one that we've come across [inaudible] platform. So that's one to be aware of, and O'Reilly is here today.

Okay, any questions on hardware or server software?

M: [inaudible]

Matthew Cutler: Does O'Reilly offer secure transaction processing? Not to the best of my knowledge right now. You can bet for most of the major server providers that if they don't provide it today, they will be providing it very shortly. I encourage you to go out ask them those questions over there.

M: [inaudible]

Matthew Cutler: The question was, "What do we like about the O'Reilly software over Netscape?" For instance, the O'Reilly software is one of the very few which is on the NT platform which is fully CGI-compliant, but it handles [inaudible] the way it's supposed to be handled, as opposed to through some roundabout ways.

Incidentally, just a little bit of a history about that. For a long time there was only one Web server that was publicly available called EMWACS. EMWACS handled CGI improperly due to some of the internals of how NT works, and many of the commercial Web servers, what they did was buy the original EMWACS code and then build on top of that. So at their very foundation they had some problems there. And that's, for example, what many of the other providers did.

It appears that that's what Netscape did initially, and they're working to correct that. But what O'Reilly did was get one of the very fundamental Web developers, one of the original NCSA guys, to rewrite an NT Web server from scratch. It's very stable. It handles CGI very well, it's easy to install and it's \$495. It's cheap. That's why we like it. We're always happy when our customers are using O'Reilly's WebSite because it means much less problems for our technical support team.

Okay, moving on to security considerations. Security gets a lot of good press these days. It makes good press and is probably a little bit overblown. This is security in terms of your network, not secure transactions, which is an entirely different debate. In security considerations, degree of exposure is key. This is how much information you have on your network which is considered very, very valuable or very, very sensitive. For most companies that probably means a lot, so security is something to pay attention to. The key factor is going to be your network topology. It's sad, but true, but the analogy between Internet security and safe sex is pretty right-on in terms of abstinence being your surest way not to catch anything. So outside of not having a Web server, not being Internet connected, there are incremental steps you can take away from that.

The safest way is to have a DMZ or a firewall, where your Web server is physically disparate from your existing network — there is no connection there. So for people on your internal network to get to your external Web server, they have to go externally and come back in. That way it's separate and self-contained and doesn't have access to other parts of your network. Unfortunately, that's a little bit difficult to pull off sometimes and it may not be the most effective means of serving your information or for using your hardware resources. It also depends on your available applications.

The WorldWide Web represents certain security risks. FTP, the ability to download files, presents certain security risks. Telnet, where you can have people who are remotely Telnetting into your system, [also presents risks.] If people aren't very secure with their passwords, or they choose their passwords to be their user name in reverse or something very, very obvious, then people who can log in under a regular user's name are going to have full access. Finally, believe it or not, even running [inaudible] mail or mail packages will present certain security risks as well; small ones, but ones that are there.

In general, more than anything, it pays to know what you're doing when you're setting up your security solutions. You can have hardware and software solutions such as firewalls, but even the most secure firewall in the world will be very insecure if it's not set up correctly. So if you have people on staff who know what what's going on in the security and network side, keep them on staff and make sure that they pay attention to this; or if you don't, it makes a lot of sense to hire out or get some advice from a network consultant.

What you'll see in terms of the firewall vendors — there are many of them here today also. Many will provide or claim 100% security. That is a lie, unfortunately. There is no such thing as 100% security on the Internet, and it's just sort of a fact of life there. It's not to scare you away, but it's recognized that the risk is there. Take all the precautions that are necessary.

It's also very important to monitor a system. What we do a lot with one of our developers is that about 10% of his week is spent just scoping around our system, making sure everything is in the right place and that it looks like it's supposed to look, because oftentimes if there's a security breach you'll be able to see little strange things going on in the system that don't make much sense, and they can often point to problems in that regard.

Another thing that made a lot of press a few months ago was a tool called SATAN, which stands for Secure Administrative something-something-something. It's a sort of "hacker in a box" and it will allow my mother — who is not very Web server knowledgeable — to download this thing, fire it up and act like she's a very experienced hacker and probe some well-known and not-so-well-known security holes in your Web site to see what's there.

Now, this was released on the Internet so that everyone would have it and everyone would be aware of some of the holes. It's a debatable strategy that got the guy fired from SGI. He did it, but what it means is that you can have one of your administrators download SATAN, run it on your Web site, and then get a pretty solid breakdown of what's going on on your Web site in terms of security issues. What to keep in mind is that if you're not running it, you can bet that somebody else is running it on your Web site. So it pays to do that. I put the question mark there because initial releases of SATAN actually have their own security holes in them. By running SATAN, you opened up new problems, so the problem is recursive. New versions of SATAN have since fixed that, but you never can be too sure.

Moving ahead into information content, the ultimate purpose of this site. I don't want a Web site so I can know about ISPs; I want a Web site so that I can serve information out to my customers or users or my people internally. Now, of course, these are going to be written in HTML, which is the Hypertext Markup Language — generally, fairly straightforward, not to be intimidating. But there are lots of fifth-graders who have their own home [inaudible] and are pretty HTML-savvy out there. It's not brain surgery, however, and it pays to know what you're

doing.

The way most people learn how to write HTML — and frankly, the way I learned to write HTML — is you bring up a Web document on one side; you click “View Source;” you bring up HTML; you go, “Oh, to do that, I do this and to do that, I do this. Great!” and you’re ready to go. However, HTML is based on a number of very well-defined, very rigid specifications that say, “This is how to write HTML. This is how to write it well.” That’s all fine and good, especially given when a browser manufacturer writes their HTML rendering engine. They refer to the specifications that say, “This is how this should be written, and this is how it should be displayed.” Then they go forward and do it based on that.

Now, what you’ll find is that different browsers have different quality rendering engines. I just learned that this has been illustrated very well by *Netscape*. *Netscape*’s rendering engine in version 1.1 and 1.2 was one of the most robust rendering engines there was for HTML. So you could do things wrong — you could forget the closed quotes, or keep brackets open or things like that, and *Netscape* would say, “Oh, I know he meant to do this, so I’ll make it work.” This is good because that means that more Web sites out there are functioning properly.

The problem is that if you write your HTML and then look at it in *Netscape* and everything looks great, you never know. If someone comes in using *Quarterdeck Mosaic*, or using something from *Spry*, or the Microsoft browser, [you don’t know] what it’s going to look like to them because their rendering engine may be a little bit different.

Incidentally, because of this, *Netscape* has de-tuned their rendering engine for *Netscape* 2.0. The new version will break on things that the old version did not break on because of this. It was sort of interesting to go through even our own Web site and to see some of the newer links that we’d put in there where it wasn’t quite right because we just all use *Netscape* — not the safest thing to do. Bottom line here is: it makes sense to know what the specs are if you’re going to be writing a lot of HTML; and to know what they mean so that your content looks as it’s supposed to look and works for as many of your users as possible.

Also, as of maybe February/March of this year, we’ve been keeping stats on our Web sites for the sorts of browsers coming in. Even in March, 98% of all our accesses were one of three different browsers in *Netscape*, *Mosaic*, or *Lynx*. Actually 10% of all our hits are from *Lynx*, which is a text-based browser, so one out of ten of our users don’t see any of the fancy graphics that we’ve paid so much money for.

So it was pretty easy back then; you could do your content, bring up the three browsers, look at it — okay, you’ve covered 98% of everyone who is coming in, you’re good to go. Today it’s about 15 to 20 different browsers to get to 98%. So it’s much, much more difficult to bring up all the different sorts of browsers and figure out what’s going on there. The spec compliance helps a lot. In terms of the actual content of course, it’s important to provide useful information with significant detail — but that’s the source of an entirely different talk that I won’t be giving today.

Moving on to information structure. Oftentimes information structure can be just as important, if not more important, than your actual content itself. Why? Because if people can’t find the content that they’re looking for it might as well never be there. It pays dividends to pay attention to what’s going on on the structure side and to put some thought into that to make sure of that.

For example: I’m a user who is looking for products specs on the “ABC widget.” Well how are they going to get to that? Is it going to require 10 or 15 clicks? If so, they are never going to find it. Early on, it was said that any page on the WorldWide Web was no more than eight clicks away from any other page. That’s probably not true anymore, but eight clicks is a lot; you can get very far. So [when] you’re requiring users to go all around, it can be very, very difficult for them to find it. Things that can help out here are a simple Home Page that will

quickly direct them to different areas and appropriate levels of detail. You don't want to have a Home Page that's 25 pages of text long, so I've got to filter through everything in order to find what I'm looking for. But you also don't want to have just menu, menu, menu, menu, content on the bottom. So it requires a bit of a mix going on there in terms of how much content you're presenting at which levels of detail, and how to give users clues in terms of which direction they're going in.

Simple user navigation can often be helped by things like a simple toolbar at the bottom that will bounce to particular spots in your Web site, and a search engine being able to search for specific terms or keywords to be able to find what they're looking for very fast. Again, any questions?

M: [inaudible]

Matthew Cutler: Good question. How do you overcome the different standards, HTML 2.0 versus 3.0? Interesting point, because you assume that there's a standard for HTML 3.0 and there isn't yet. What we actually do on our Web site — if you're not using 3.0 tags in terms of tables and centering and backgrounds, you look really old and stodgy. But at the same time, you're really only writing for about two or three different browsers. So for the pages that we do 3.0 tags, and we have links to 2.0.

What we have to do is maintain separate versions of our pages and in the different compliance standards. The issue that I was touching on was that landscape has been incorporated into a lot of 3.0 — and arguably even 3.0 and beyond ability — and a lot of the browsers can't keep up, the problem being that there is no officially-recognized IATF-certified RFC for HTML 3.0 yet. It's in the works and supposedly coming in any day now. It's an issue.

There's some more advanced content-creation tools that are coming out that will allow you to, depending on the browser coming in on the fly, present it as appropriate. This will become even more problematic when you have things like *Java* in your Home Page. I'm not sure [inaudible] you'll hear a lot about that at this show, but if you're using the *Java* browser and go to Sun's Home Page, what you get is a different Home Page, which is like this information application where buttons pop. It's very neat and very cool, and it detects it on the fly. But what will probably start happening is the newer generations of browsers. When they make requests, they'll say, "I'm looking for this document, and, oh by the way, I understand the following things: I understand GIFs; I understand JPEGs; I understand HTML 3.0 and *Java*," so that your server will be able to respond accordingly. Both the market and the technology are moving in that direction.

M: [inaudible]

Matthew Cutler: Okay. The question was, "How many people do we have on staff maintaining our Web site?" Well, because we're a Web development company, you could say virtually everyone maintains our Web site, but we have a team of about three or four Webmasters who are primarily responsible for that. net.Genesis started a sort of thing called the Webmaster's Guild, which is the first professional association of Webmasters; it's now an independent organization. We're actually going to be having a meeting on Wednesday night here. Stop by the net.Genesis booth if you'd like more information about that.

What we determined, as part of the Webmaster's Guild, was that the Webmaster is really not a person but a function of six different disciplines: contact, creation, technical implementation, information architecture of graphic design, project management, and marketing. Those are the functions that are embodied; you can divide it up across as many

people as possible.

The second question was, "Are we currently programming in *Java*, and what's the timeline until that becomes widely implemented?" Yes, we are currently doing *Java* development mainly internally just for us to get up to speed on it. How long before *Java* becomes very widely implemented? It could be very soon based on what is going on out there.

The fact that Netscape has licensed *Java* and is incorporating it into their 2.0 browser means that it's going to be very big, very quickly. There's still a lot of things going on in terms of the underlying *Java* technology. It's still beta technology for virtually every hardware platform, and it'll need some bug tests to be brought through it. I'm not sure how many of you have really experimented with it. It's cool and it's cute right now, but I've yet to see a really interesting application developed with it. Until those sort of applications start coming out and there is a compelling reason to be using *Java*, it'll be interesting.

M: [inaudible]

Matthew Cutler: The question is, "Is there a natural progression from HTML to *Java*?" Yes and no. *Java* is really a quantum leap that supersedes HTML. HTML is just a little piece of it, but it's C++ in operating systems and all these things too.

M: [inaudible]

Matthew Cutler: The question was, "When do I think HTML will die and something else come up?" My crystal ball is a little cloudy on that one. It's tough to say. What will start happening, I see more and more, is there will be more and more format-supported PDF, *Java*, etcetera. And what you'll see is there will be probably less strict "this is only HTML mechanism" and more of that dynamic information exchange. When you make a request, your browser will say, "I understand the following types of information formats." And then it will make intelligent decisions and say, "Okay, this guy is running a high-speed server or high-speed browser on a fast Internet connection. I'll send him the PDF file because that will look better," versus, "Oh, he's on a very slow modem. I better send him the HTML because it's smaller." Things like that. But that's a little bit in the future.

M: [inaudible]

Matthew Cutler: The question is, "Will the browser always be there in terms of a single window presenting the content?" Tough to say. There is some interesting movement towards the browser being integrated with the operating system on a very fundamental level. So what will start happening is that the distinction between hard drive and network and between browser and desktop gets very, very blurry. You'll get to the point eventually where you don't care where your content was at; you just want your content. It should be transparent, but that's further down the line and a little bit outside what we're doing here. We've still got a lot to do.

For [inaudible] makes very good press as well. This is the netiquette of what's going on in the Internet and how not to piss the general community off. It's generally overblown; a little bit of common sense will make things a lot easier. By the way, do not use spamming as an example. If you don't know what I'm referring to, it's been a long time since this has happened.

Avoid over-hyped advertising or traditional marketing messages in general. The attitude of taking your 8 1/2 x 11, slickly-done glossy that you're going to be putting in *Time* magazine, scanning that in at 300dpi as a JPEG and sending it out to the Web, is a quick way not to get a

lot of users. Obviously it makes sense to have a little bit more consideration and think about the medium there.

Avoid extraneous images in multimedia. You often find multimedia for multimedia's sake; in fact, about probably 95% of all CD-ROMs fall into this category, or [the category of] multimedia CD-ROMs where they're just throwing in video for the sake of doing it, and it doesn't really add much to the message. When you're using the Web, content counts because the bandwidth issues are very, very real. So on your Home Page, having a very large graphic that's the first thing that downloads — and you'd be surprised, a lot of companies do — is also a quick way to slow down users. If it takes 45 seconds to open up your lead page, people are going to go away.

Overly-nested information is one thing to get away from. That's what I touched on [earlier] in terms of information structure. Information that's really, really deep in the hierarchy is oftentimes difficult to find and won't be found. And non-intuitive links, you'll see a surprising number of these as well. You'll see a relatively innocuous link; you click on it and suddenly you're downloading a 2.5 megabyte video file or FTPing something that you didn't know about. You like to set the users' expectations of what to expect when they click on this link. And that's just, again, common sense.

For advanced features, things like form support or image-mounts or general CGI scripting... Forms are the forms that allow you to type in information and submit information back to the server.

CGI image-mounts are clickable images which allow you to present like a map of the United States, and depending on where you click, will bring up a different Web page.

And then CGI scripting involves a lot more. What CGI stands for is the Common Gateway Interface. CGI is not a programming language. It often gets interpreted as one, but it's mainly just a specification that defines how Web servers can talk to other programs and how other programs can talk back to it. CGI programming is true coding, not HTML. I mentioned fifth-graders before, and I would be shocked if there would be many highly-proficient fifth-grade CGI coders. Being able to do CGI requires not only a coding background, but also a familiarity with the specifications. As embarrassed as I am, given my engineering background, I cannot code. So I am CGI illiterate. It's very technically complex. But the flip side of that is that CGI is what really enables Web sites to be interactive.

A term that I coined a little while ago, to applause as well as derision, was "interpassivity;" that most Web sites out there are not that interactive, even though the Web is this great interactive medium — but it's just point and click. They're lacking, and what they're lacking is the interactive element supplied by CGI. We're really engaging the user and doing some sort of user-feedback, dynamic document creation discussion forms; things like that. It enables search functions, it enables on-the-fly generation, database-driven Web sites, database integration, as well as discussion groups.

Right now, this is where my company focuses. We have products that address a couple of these issues that take away a lot of the technical issues and make it easier to use as an end-user. But that's where — just a little bit of a background with what we're doing is — we're trying to make this area easier because we recognize that it's often very, very painful for a lot people out there. Questions on CGI?

Okay. Into ongoing maintenance. Ongoing maintenance is often the larger task of having a Web site. The idea is to get consulting requests of people saying, "We have 10,000 documents and we want to get them into HTML and put them on the Web right away." The first question to ask now is, "What happens next?" They say, "Next?" We say, "Yes, you have to maintain these things down the line, keep them current, keep them updated and keep them running. And in the long term, that's probably going to be a much greater cost than the initial setup." For

HTML, you have to make sure that your HTML is verified; that it's specification compliant, "HTML spell-checked." There are a number of freeware utilities that do that right now. None of them do it especially well, unfortunately, but expect to probably see some commercial development in that area soon.

Link integrity is a big one. Link integrity is that if you have a link on your Web site, it needs to be pointing to where it's supposed to be pointed. As a result of some earlier studies that we were doing internally, we discovered that at any one time between 20 and 25% of all links on the Web are invalid, so one out of four mouse clicks will get you to an error page. That's not very good.

Link integrity can be compromised for a number of reasons. It can be involving content — you're adding content in, etcetera. The WorldWide Web is exactly that — a web of documents interlaid over each other. A document in each [inaudible] doesn't mean anything except in relation to the documents that it's linked to and that it links to as well. So as you start adding content in, putting more nodes into this web or moving things around, you're breaking the threads out. It becomes very, very easy for links to become invalid. Now, if you have four or five Web pages, it's pretty easy to every morning come in and click through your links. Everything's there; cool, rock and roll. For us, we have several thousand Web pages on our Web site. IBM has between 25,000 and 50,000 pages on their Web site. You can bet that it's not an easy task to do manually and that there's got to be some management to do that. There are a number of tools coming out to help you with that as well.

We also have hardware errors. If you're linking to external sites, their site can go down. You're not responsible for that, but users from your Web page get errors because the Web site is not there. Well, that's a problem, and you need to be able to detect and know where those links are in order to insure that your users are getting as many correct links as possible.

You have things like feature maintenance too. Let's say you put this really good search engine in, right? And the search engine generates an index based on your content. Well, then you add content and move content around. You need to make sure that search engine index gets updated so that it reflects your current content situation. We'll see sites — and some very, very large sites — that you go into the search engine, search on a word, get a link, click on that link, and that one's invalid. So they string you along and then drop you on the floor because their search engine hasn't been kept current with their Web site.

And finally, feature maintenance in terms of [inaudible] discussion areas. You want to keep the discussion areas fresh, with recent posts in there. Having posts that have been laying around for four or five months is oftentimes not very effective.

And site usage analysis, which is receiving a lot of attention in the media and a lot of development there, comes with the ability to generate a marketing approach based on your Web site, and that is very important. That's an ongoing maintenance task.

Moving on to the capital costs associated with this. How much is it going to cost?

M: [inaudible]

Matthew Cutler: The question was, "Is it common practice, when you get an error from your Web site, to log it or to send e-mail to the Webmaster?" There are error logs kept, and you can configure them as appropriate. What you'll oftentimes see is that they present a lot of information which isn't necessarily worth keeping, like if someone types in a URL that doesn't exist, but they're looking for it on your Web server or they're looking for a page that's not there. You'll get error logs of that. But that's a good way to do it. You can also set up e-mail gateways and things like that. I'm not sure of any commercial products that do that today do it very effectively. Any other questions?

M: [inaudible]

Matthew Cutler: The question was, "There are a number of tools available right now, or products, that allow you to create [inaudible] documents without actually having decoded." And it's true, there are a lot of them. They are simple, and I'll touch on them a little bit towards the end, but there are HTML editors which are point-click interfaces. To that what we have seen — for us — when we do our HTML generating, we use *EMACS*, which is a UNIX text editor. It's a good development tool, but it's about as bare-bones as you can get. The main reason [we use *EMACS*] is that with most of the HTML editing tools either the interface is so clunky that in order to do a tag, you've got to Alt, Shift, Drag and Header each one — yes, okay, and click — and in [inaudible] you get "Bracket, Bracket..." It's easier, if you're familiar with it, to just type it in. There are some newer generations that are coming out that have more capabilities and better interfaces, but we haven't found one that we're very comfortable with.

You often find ones also that don't fully support the feature set, or that are limiting; that you can't do tables in or that they do things wrong. For instance, *Microsoft Internet Assistant*, which allows you to save *Word* documents as HTML, I'll use sometimes to quickly create documents; but I'll create the HTML, then bring it up in *EMACS* and spend ten minutes going through it to make sure that everything is right and to change things as I like them.

There are also fully-integrated browser server packages. [Inaudible] sells one. What they have is a front-end creation tool and a server. The problem there is that what you're doing is dependent on each other. Your content-creation environment presupposes that you have this certain type of server, so you're locked into their solution; you're locked into their updates and things like that. What we really like to maintain, and we think is very important, is the ability to control and maintain your content as freely as you choose. Having solutions that tie you into doing things the way a certain company thinks you should do them makes us nervous; but depending on your environment, that may make sense for you.

Closing up on the building issue right now, for capital costs, you have your Internet connection that will get you multiple [inaudible] this way. You have your installation fees. Getting the phone company to install the phone lines, which is actually — as we're finding right now as we're moving office spaces — the biggest part of the entire problem; getting them to actually do it. But they charge you when you have required hardware. In order to get your Internet connection functioning, you need a thing called a CSU/DSU and a router, and those can be very expensive pieces of hardware. Then you have your line, as well as your provider fees. So you're paying fees to your phone company for access to their phone lines and then provider fees to your Internet service provider for them taking care of all your Internet connection stuff. So that component can be very expensive.

A full T-1, first year including installation, costs between \$34,000 and \$36,000. [These prices] are about average, and not unheard of. Prices are coming down as the competition is heating up, but it's still a very, very expensive proposition, which is oftentimes a reason people choose to outsource the information, their Web site contact [inaudible].

You have the cost of the host computer hardware and the associated technical support. Let's say you're a Macintosh graphic design house, but you decide to go with the UNIX workstation to develop off of. If you don't have any UNIX expertise in-house, you're going to need to hire out to do that, so that could be expensive as well. And your computer — you can get a reasonable Pentium desk-top system with a good amount of RAM for about \$2,500 today. You can also get a pumped-up [inaudible] or Alpha station for 25, 30, or \$40,000, depending on what configuration you get.

Building costs also involve human resources.

A Webmaster is a big one. We get lots of requests for that. For a while, when we were doing more consulting — we do relatively little consulting now — we could almost have started a division called “net.Genesis Headhunting,” where all we did was refer UNIX experts around to the companies that were looking for them because they’re in very high demand right now. The reason why we didn’t do is that we were hiring them all internally ourselves, so we weren’t passing on good people. But good UNIX programmers, good Webmasters, are very difficult to come by these days and are in very high demand. So if you have them internally, treat them well because they’ll be getting good offers from other sources. There’s a forum where lots of Webmasters would meet, so for companies that are looking to hire them, that they have a place to look towards.

[Inaudible] a cost of the content generation. Not only are each [inaudible] CGI, but also how much content are you going to custom-create for your Web site? What we find is that we have a lot of marketing material as a company, but there’s tons and tons of original content that only appears on our Web site, and that takes good people’s time, and the cost of the ongoing technical maintenance to keep the thing alive, and the time in learning curve associated with getting up the ramp.

As you can see, with all these factors, you can look at the \$24,000 T-I; but when you look at the cost of people here, that can be the greater side of it.

What we also see oftentimes is companies that are putting up Web sites that have these very over-worked, over-stressed UNIX developers or system administrators; they’ll just add Web site to their list of responsibilities without taking anything away. You know these people are already about to crumble. Web sites can actually require a lot of attention, even very, very professional Web sites, and people need to know what they’re doing. So if you’re going to be assigning someone to keep this thing alive, make sure that you give them time in order to do that. It can be as much as 10 to 15% of a week.

There’s lots of companies — for example, *Hot Wired*. I think they have there over 45 people. *Hot Wired* is an on-line magazine, and every single person on their staff is contributing to their Web site. So they have 45 “Webmasters,” depending on how you look at it. Okay, that’s the end of the building session. Any overall questions on that?

M: [inaudible]

Matthew Cutler: Yes. Oh, very good question. The question was, “How long does it take to get IP addresses?” In order to set up your Web site and get connected to the Internet, you have to deal with an organization called the InterNIC. What the InterNIC does is register your domain name, set everything up, etcetera. It used to be free to do that, but because they were getting so deluged now it’s \$50 per year, per domain name.

For a long time, it initially took about a week. And then they got flooded, and they took about six weeks to process a request. Lately they’ve been out about four weeks. But we’re moving office space right now, so we need to have some of our DNS stuff changed. We submitted our DNS change four weeks in advance, anticipating that it would take four weeks and that we could make the move in the meantime. Well, the InterNIC, being the InterNIC, turned it around in 48 hours. So what happened was that our stuff got changed over much, much faster than we expected it to, and we weren’t ready for it. That caused problems down the line. So it’s very inconsistent. Give it time, but understand the issues there.

What’s also interesting is that the way that it works is that the InterNIC makes changes, and then they propagate throughout the Internet. So even though the InterNIC changed our DNS information in two days, it took two weeks for it to propagate through in fact, until anyone really found out about it. So it was even too late, once the change had been made, to

submit a request to change it back because that would then take two weeks longer to filter through. So there is a bit of a time delay there. It's interesting to deal with. But even we, as a Web development company, run into problems with that whole situation.

Yes.

M: [inaudible]

Matthew Cutler: I don't understand what you mean by "PC platform."

M: [inaudible]

Matthew Cutler: The question is, "Does the difference between having a Pentium Web server and a UNIX workstation Web server — what's the degree of magnitude to justify the cost of that additional investment in UNIX?"

Well, in general, if you're really going to be investing to have everything internal, even a very high-end workstation is going to come out in the wash. But the issue there is not cost, but stability of what you're doing. Would I allow my corporation to publish its corporate Web site on a PC platform? No, I wouldn't. We did for a little while, running a Pentium system with an operating system called LINIX, which is a free version of UNIX. It's a great operating system, but even that has its issues. We were on a DEC Alpha running OSF-I.

For us, because we're a [inaudible] company, our Web sites are a really core component of our business. I wouldn't trust anything else but UNIX. When you look at it, to get a workstation that's pretty well-loaded, it's about \$7,500. To get a pretty well-loaded Pentium system, you're looking at \$3,000 or \$4000. Your delta there is small. What you also have, dealing with the UNIX platform in general, is that software for UNIX is much more expensive than for other platforms. For our product's pricing, one of our products is \$500 on NT, but is \$900 on UNIX. It's just the development issues and the general sort of accepted normal practices in the different computing environments. Overall though, because there is so much time and energy and so much manpower involved in it, it comes out in the wash. It really does.

Yes.

M: [inaudible]

Matthew Cutler: About platform?

M: [inaudible]

Matthew Cutler: Yes, what about it?

M: [inaudible]

Matthew Cutler: Oh, okay. The question was the feasibility of using Macintosh as a server platform. I had a Mac for a long time; I'm a big Macintosh fan. But when I was really doing some good processing on it, I was lucky if I could go a full day without having it crash, and I think that's an issue if you're going to have a high-traffic Web server.

For some of the lower-traffic Web servers, that's fine. There's more and more Macintosh development occurring these days. Star NINE makes a good Web server for the Macintosh platform as well. But it's more of an issue of general system stability.

Through my friends at school, I've learned a lot about how a Macintosh works on a very

fundamental level, and for that reason I wouldn't trust it. I understand how Windows 95 works on a very fundamental level because my whole system came down just a few nights ago — interestingly enough — and I wouldn't trust that either. But I do understand how NT works, and I do understand how UNIX works. On a fundamental level, I trust it. When it comes down to it, I don't trust Macintosh, but that's more of a personal preference. You'll find Web sites out there that are run on Macintosh, but you won't find any very high-traffic Web sites or large-scale Web sites to the best of my knowledge. All of them are running UNIX, and a very few are running Windows NT.

In general, because so much of this stuff is untested and it's all new ground, having precedents set is very important. You know, a lot of companies will say, "Oh sure, it's just Internet. It should work." Well, there's a lot of new complications that are introduced by the Internet, so it pays not to be a forward thinker in certain respects. The purpose for our company is to get out all the kinks so that companies that are just looking to do regular business on it, can do it effectively. Any other questions?

Yes.

M: [inaudible]

Matthew Cutler: Oh, good question. The question was, "What do I consider a high volume?" Again, of course, it depends on the platform, but generally high volume is more than 30- to 45,000 requests per day. But it depends on really what's going on.

Some people will say high volume is more than 10,000 requests per day. We have Web sites out there that get well over a million hits per day. Our Web site gets tons and tons and tons, so it depends. And it all depends on when you're investing in your hardware platform. [You may think,] "Well, you know, I'm a small company and I'm providing this relatively small page. I'm not going to be getting that many hits." Well, yeah, today you might not be getting that many hits; but in a few months or in a year's time, how much traffic can you expect to be receiving? And how is your hardware platform going to mature to handle that? Expandability of your hardware platform is a very important issue.

Yes.

M: [inaudible]

Matthew Cutler: Sure, we'll move on in about two minutes.

M: [inaudible]

Matthew Cutler: The secure unit versions of...

M: [inaudible]

Matthew Cutler: Oh.

M: [inaudible]

Matthew Cutler: Right, right.

M: [inaudible]

Matthew Cutler: The question was [regarding the] issue of network security of operation system security; is there going to be a market for government-spec UNIX platforms that are used for serving their stuff? Tough to say. I would think the security issues are probably overblown. There are military spec computers that you can drop out of planes that will still work, by the way, and I know companies that use them. But that's definitely overkill.

You hear issues in terms of UNIX being not as secure a hardware platform. It's actually the reverse. UNIX is the most secure because it's been in existence the longest and has been poked at and tweaked and touched by the most hackers. Windows NT hasn't gone through that process yet, so it remains to be seen how well that holds up. The issue is, it's probably overkill. I'll move on; I'm sorry.

In terms of buying Webs that are outsourcing, I'll go through the general requirements, talk about the issues of Internet consultants and touch on the external costs.

The general requirements, if you're going to be outsourcing, is that you need a system outline. A system outline involves a short-term plan as well as a long-term plan. It is very important to differentiate between the two. Again, if I'm moving too quickly, please feel free to ask to slow me down.

Short-term plan being: what's your plan for the minimum amount of Web site content? What can you comfortably publish as "www.mycompany.com" and not be embarrassed about it? What's your long-term plan? Oftentimes companies get the two confused and say, "We want our Web site to be fully secure and commerce-enabled; credit card transactions; full order processing; catalog, etcetera, etcetera." And it says, "Okay, that's a good goal to work toward, but let's figure out a shorter-term goal which is a little more realistic to hit." And then you can build on that, moving forward. It's very, very important to do that.

What we recommend, based on our engineering backgrounds, is to do a prototype system where you do a mock-up of a system which suggests some of the functionality; evaluate that; critique that; show it around internally, and then build the short-term plan and the long-term plan.

You have to have some ideas about system structure — how that's going to look and of course, what the contents are going to be. As a consulting company, we would get a lot of people, a lot of large companies, that would say, "We want a Web site. What should we do?" And that's an entirely different problem of deciding how the system is going to look, how it's going to fit into the organization versus how you're going to develop it technically.

You'll see today that there is actually becoming some differentiation in the Web consulting marketplace in terms of their Web consultants — that's a WorldWide Web marketing consultant, that's a WorldWide Web advertising consultant, or that's a WorldWide Web technical consultant — so that you can differentiate between them. And oftentimes you'll see consultants that bill themselves as [inaudible] "We'll do the whole thing. We know every aspect of your business. We know every aspect in this technology." Chances are they are going to be pros at one and amateurs at another or amateurs at all of them, etcetera. It's very rare that you'll find a complete consulting company that can effectively do every single aspect of Web site design. But I'll get to that in a little bit.

Towards content definition, there are issues involved there. It'll help a consultant a lot, the further along you can bring them, if you can say, "This is what the pages are generally going to look like. We want to have a products area and a services area and a support area," something like that to help to give consultants a better idea. And even to specify links if you can say, "This area is going fall into this area in the following manner," and to have the information in electronic format.

My consultant company bills out at \$125 per hour. It doesn't make sense to be paying us to do your typing. So if you don't have your content in a readily-usable graphic format or

electronic format, then it's important to convert that into that environment until your consultants can work with it. And depending on the company, we've worked with companies that today are powered by PDP-11s, some of the very, very initial business work computers. For us to get the content out of there is very painful, but it needs to be paid attention to.

What we recommend, and what we actually require for any consultant work that we do, is a design document. This comes out of doing lots of design experience in different fields at MIT. What it does is really provide a clear plan of action. It's essentially a functional specification that says, "This is exactly what is going to be delivered." What it does is set the goals, assess the capabilities and set real deadlines for the system. It should be a significant portion of the budget in mechanical engineering and many other fields of engineering. The design phase of a project should take about 80% of the time and money involved.

For mechanical engineering, it's very important because changes down the line can be very painful. But that's true here [as well]. What we do with the design document is sit down with our client and really nail down exactly what is going to get produced: when, why, how, what dates, what the payment figures are, etcetera, because what happens as you get into these projects, whether you do it internally or externally, is that new ideas come up, or people get excited about it and have new concepts and want to move things around. It's really a very, very effective means of completely scattering the entire development process and making sure you'll never get your Web site done.

So what we do is say, "This is our design document. This is what we agreed to sign off on. If there's any changes down the line, we can evaluate it in terms of the design document." [Later we can] say, "Look, if you really want to make this change, well, let's see how it's going to affect the delivery; let's see how it's going to affect the budget." What you'll often see is that very, very small changes can have very big ramifications like, "Oh, we know we told you to do the Home Page this way, but we decided that we just want to do it this other way." Well, it's just one page of HTML, right? But the Home Page determines the entire structure of the system down below, so you can spend 15 minutes changing an HTML page and spend days changing the rest of the HTML hierarchy. So it's important to understand these things.

Also, as new ideas come up it's easy to say, "Oh, well that's a great concept, but we need to get this done first, and then we'll explore that down the line. Write that down and remind me when this is all done with." So it'll really maintain the focus, and that's very important and we require it for any consulting that we did or currently do.

For Internet consultants, there are a number out there today. There are literally hundreds, if not thousands in business. We founded net.Genesis in January of 1994, and there are probably about three or four other companies that we knew about in the entire country that were billing themselves as Web consultants or doing Web development. That was okay because there are about three or four corporations that were looking for Web consultants, so it was just as competitive as it is today. But it's really been interesting to see how fast it's grown and how many people have come on board as Web consultants.

You can look out there, and there are hundreds, if not thousands out there. At the show today, there is [inaudible] Interactive; they're the company that did the White House Web site. Direct Results Group — I don't think it's here — they do a Web site which is very cool. BBN Planet is here, and there are more and more and more out there.

To locate Web consultants, an easy way to do it is on the Web. *Yahoo* has a listing of Web consultants that's over a thousand long. *CommerceNet* also has one. What's interesting about the *CommerceNet* Web-consulting pages is that when you register as a consultant, there are about ten or fifteen buttons that you can check as areas of expertise. What you'll find is that every single consultant checks off virtually every single one of them, so it's pretty hard to differentiate. Okay, they have all said they have UNIX expertise — who is really the expert, and

who is really proficient, and who doesn't know what the hell they're doing? It's difficult to determine that.

So how are you going to do it? Probably the best way is to look at existing sites. Go out to an existing site, one that you like, one of your competitors, one that's similar to how you want yours to be. Then write to the Webmaster and say, "Hey, how did you guys do this? Did you outsource it? Who was involved? If you did it internally, what did you think?" And you can get good references that way.

What you'll find, because there's so many new companies out there, is that there's a very broad range in terms of them as businesses, let alone the work that they do — young company, inexperienced people, not even professionals who have done this before. And even though they can produce beautiful work, if they're over budget, over deadlines, if they don't return phone calls, if they're just painful to deal with, then is it going to be worthwhile going with them? So not only be diligent in terms of [evaluating] the quality of the work that a consultant [can do], but also [determine] how they are professionally to deal with. That can be a very differentiating factor.

What we have focused on as a company, very early on, was just that — because we are relatively young and have a lot of that to overcome. So customer focus is very, very important for us. And you'll see certain Web consultants that excel in this and certain Web consultants that do not. It makes sense to choose them accordingly.

You have to evaluate [Web] consultants in terms of their capabilities. What are their main areas of expertise? For us, when we were doing consulting, we didn't do graphic design. We outsourced it all because we don't have any graphic designers in-house. Now it's like when the Macintosh came out as desktop publishing. You bought *PhotoShop*; you bought *Freehand*; and yeah, I'm a graphic designer, rock and roll. It really doesn't happen that way. And experienced professionals are important in different areas.

The size of the consulting company varies quite widely, not only in terms of numbers of employees but in terms of capital equipment — what they have in-house. You'll see like Digital Computer — DEC does Web consulting, and obviously they're a giant organization. You also have husband/wife/dog working out of their garage doing Web consulting. What's interesting to know about this is that everyone is new to this game in terms of the technology. If you meet any consultant that says they have been doing Web consulting for 15 years, they're lying. The Web hasn't been around for that long. The Web has only been around, for all intents and purposes, a little over two years. So for us — we were founded about two years ago — we're dinosaurs in terms of Web years, even though as individuals we don't have very much gray hair. So it's difficult to tell.

And just because it's a small team does not mean that they can't do really great work. What it does mean, if they're a small team, is that they can't take very many concurrent projects. If you're working with a small team and you ask them what else they have going on, and they say, "Oh we have six other large-scale projects in the works right now..." There's only so many hours in a day, and there's only so much a person can produce.

That touches on resource availability. Location. Location is actually a really big one, and there's a lot of debate about this. This is the Web. This is the Internet. There's no reason that you can't do things telecommuting and remotely. We can Telnet into a Web site on the other side of the country and upload content back and forth, and there have been arrangements this way. I've heard about consulting deals that were introduction, initiation, closing the deal, project completion — all over e-mail, all remotely, never even a phone conversation involved. It's possible.

For us as a corporation, we would not be very comfortable working that way. The ability to meet with your client, to sit down and work as a consultant, to see them on a regular basis,

check progress, see how things are going, is very, very important — especially if you're doing an important site or one that's expensive; that has a lot of stuff going on. It's worthwhile.

What we've seen is that the bulk of our consulting clients have been in the New England area, so that they get to be close to us. If we were bidding on a project that was in the Midwest or on the West coast, we just stopped doing it because it was too painful to manage that sort of relationship.

Price. They vary quite widely in terms of price. Any price figures I mention here, you can go out there and find an order of magnitude below and an order of magnitude above. And you can say, "Well Matt, you told me that it was this and I found this guy that said it's..." My company charges out when we do consulting at \$125 an hour or \$1250 a day for off-site work. We get told that's about average to a little bit low. There are other consultants that will go for \$50 an hour or that'll go for \$25 an hour, especially if they're still in college. There is Anderson Consulting or some of the large, large consulting firms that will bill out at thousands of dollars per day — three, five, six, ten thousand dollars a day to do that. So it really depends on who you talk to.

It also depends on the quality of service and what you're getting done. In general, if you're spending \$10,000 a day you're probably spending too much. If you're spending ten dollars an hour, you're probably spending too little, and you're going to be getting what you paid for. So keep that in mind.

And then experience. What else have they done? What other Web sites have they done? Who else have they worked with? In what regard? For us, in terms of our company, when we were a Web consulting company we were technical consultants. We did the very high-end technical work in terms of, well, we're pushing the technology in this regard. Who could we bring in to do that? We would not do a lot of HTML. So it depends on the background levels of expertise in evaluating a consultant.

Previous work and areas of expertise. Do they know UNIX? Do they know Windows NT? Can they HTML author? What sort of CGI have they done? What have they done in terms of software development?

For collateral competencies, this can often be a good indicator of what's going on with a company. Do they write publications? What is their industry involvement? It's really easy for a company to put their head down and just focus on the Web and focus on what they're doing; but it certainly can be very useful if they sort of look at what's going on, on the Web in general, on the Internet community in general, and become more involved with that because that will help them down the line. And that's something that we think is particularly important and that we pay a lot of attention to. We're not just a Web company, but we do a lot of other. You'll see many other consulting companies that do that.

There is a consulting company on the West coast — I forget which one — that organized Net Day, where they're organizing all the Webmasters and Internet people in the Internet community to go out into the general community, to schools and teach and things like that. And that's a really great thing. It's really very powerful.

Services offered. Different consultants will offer system design in terms of helping you structure your system and how that should be done.

Scripting capabilities in terms of CGI, HTML-generation and so on. Obviously most consultants will do that, depending on who they are. Many will offer content conversion facilities to do text, to do image scanning, to do multimedia recording. [Inaudible] you have training videotapes and converting into a QuickTime movie. A lot of consulting companies will offer those. Again, those are areas that we do not offer at all; that's not our focus. So it's just a matter of figuring those out.

Others will offer graphic design. There are lots of issues involved with graphic design on

the Web and how to be a good designer. What's the difference between a [inaudible] and JPEG? There's actually a very big difference, and there are certain situations where a [inaudible] is more appropriate than a JPEG and vice versa. There's little things like the difference for, I think, a [inaudible], which is a relatively dumb image format. For a file size of a file that's 63 colors, there's a big jump between 63 colors and 65 colors, but almost no difference between 65 colors and 67 colors. Why is that? Sixty-four is a power of two, and as the bit count goes up your file size balloons. That's just a little, small tip that's important to know when you're publishing on the Web, because bandwidth counts. And the image quality between 63 and 65 is pretty much indistinguishable, but the file size, how long it takes to download, can be very large. [There are] lots of little street-smarts that help, so the services offered can be important.

What we did when we did our graphic design is that — we don't have any designers in-house. We worked with a small design firm and sat down with them and told them, "This is the way to do design on the Web. These are the technical issues," and gave them constraints that they worked very, very well with. We have been very happy with the work that they've done. Issues like, "We have a [inaudible] and we want to do a gradient." Well, you can do a gradient that goes from gray to black that has 150 different colors in between, or you can do like a little speckle where it's just two colors that gradually intermix. Now, obviously the two-color one will not quite look as well, but it'll be much, much smaller because you're using two colors versus 150. [These issues are] things that count, things that add up.

Content hosting. I actually took out a slide about content hosting, but I wish that I hadn't. Many consulting firms or ISPs will do content hosting, where you rent space on their Web server. You rent space on their Internet connection and locate your content remotely.

Now, there are a bunch of issues involved there. First off is: what are you getting for it? What sort of hardware platform are they using? Are they using a high-end workstation, or are they using a whimpering Windows 3.1 machine? What sort of Internet connection do they have?

They could be content-hosted by IBM or BBN. If you can get [inaudible] of their backbone T-3, that's pretty nice, but it's very expensive. Are they using a 56KB line where your content is not going to be served that quickly? What sort of Web server are they using? Many content-hosting firms will offer secure Web servers, and in order to run off that, you'll pay more. Do they offer multi-hosting capability? Multi-hosting is the ability, when you registered a domain name, to have multiple domain names at a particular machine. It's very much in vogue to have "www.mycompany.com," and if you don't have your company name, all hope is lost. It's really not true, but people do pay a lot of money to get rights to certain domain names. But if you're content hosting, what you'll have is multiple domain names pointing to the same machine, and that presents problems. You need to do certain things technically in order to pull that off very well. Certain companies will provide that; other companies won't, where you won't be able to do exactly what you want to do.

More important than that, though, is the degree of access you have to your content. Any time when you're hosting multiple people's information on a single Web site you're going to have different people coming in and editing the information, which presents security problems. So you have to ask how much control you're going to have over your content. Will I be able to update it freely? Will I have access to the CGI BIN directory?

Many of our clients for one of our products [inaudible]. They use that form because it eliminates a lot of the security holds if they're in ISP, in terms of CGI BIN directory. So you can imagine investing all this money putting a Web site up and then realizing that you don't have access to it, that you can't do the scripting that you want to do, that they won't let you install the software, etcetera. Suddenly it doesn't become such a good deal because it's really restraining. So it pays to ask all the right questions there.

There are lots of companies here that do content hosting. Ask those sorts of questions. You'll see pricing all over the place. You'll see pricing for ten bucks a page. You'll see pricing for \$200 per megabyte transfer. The pricing models vary. Some of them do [pricing] based on how many hits you get. [Depending on] how much of your bandwidth you are using, they'll charge you more. Other ones charge per page; other ones charge per amount of hard drive space. It's really all over the place. But you'll get different sorts of levels of service. You also get 24/7 support from some and not from others. If the Web server falls over at 2:00 a.m. on a Sunday morning, who is going to be there to bring it back up? Is that going to be possible? If it dies on 5:00 p.m. on a Friday, is your content-hosting company going to be gone for the weekend and your whole content down all weekend? There are certainly situations where that can occur.

For the costs of buying a Web site, you have your consultation fees, obviously, paying for the people's time that they're spending with you; the cost of the HTML generation; the cost of CGI scripting, which can become expensive depending on what you're doing. Are you doing some pretty general CGI scripts? Are you doing some very, very specific, very, very complex scripting? How is that going to take place?

Custom development. The question was asked earlier about *Java*. You'll be seeing more and more consulting that falls under the custom development as *Java* becomes more important, because *Java* is just another programming language. People will be developing custom *Java* applications as opposed to straight CGI scripts.

Then you've got the costs of content hosting and the issues there, and then cost of technical support down the line.

What I didn't touch on is [inaudible] a Web site internally. You could pay for network consultants to come in or to administer your site remotely so you don't even necessarily have to encumber all of the maintenance internally, but you can externalize that as well.

Before I go on to both, I sort of ripped through the buying aspects. Any questions on buying? Okay.

This addresses the issues of what to build, what to buy, and what else is out there that's useful. Of course, this is generally going to be the most appropriate route to go down in terms of one form or another, but it really is dependent on what you have internally versus what you can get at externally.

For internal investment, you can train or acquire in-house staff to do things like basic system design and the basic layout, to do a lot of the content generation and to do some of the ongoing maintenance. One thing that we have found quite a bit, especially in terms of large corporations, is that you'll say, "What do you have in-house?" And they'll say, "Nothing, we don't have anything internally." But the Web and the Internet are really cool stuff and people are very, very excited about it, so many people will actually have Internet experiences outside of work, Internet experience without their bosses knowing about it; or if they don't have that much experience they're very jazzed to learn about it. So training in-house staff can often be a very attractive way to go because you have staff that's motivated to do it and think that it's fun to learn.

Of course, there's the issue of how exactly to train them, which brings up a lot of possibilities as well; trade shows is one of them. But we've seen a really, really positive response from corporations. By adding something else to someone's task list, you're teaching them a new skill that they find very valuable and interesting to work with.

For outsourcing, you can seek experienced assistance in things like overall system design and project planning. If you've never done a Web site before, and chances are you haven't if you're doing an external Web site for the first time, it helps to sanity-check your ideas. Say, "This is what we want to do. By the way, you're an experienced Internet developer — what do you think?" And usually it should be just a check-off. But oftentimes, because someone won't

fully understand the capabilities of the technology — because a lot of Web technology and Internet technology has very real limitations — they expect things on what they want to do with their Web site that aren't possible right now. You know, "I want to do 3-D interactive gaming with real-time video." It's going to be difficult right now. It's possible, but it's probably something that's a little bit further down the line. But even smaller issues can come up and can really bite you if you don't get those checked down the line.

Project planning. How long is this thing going to take? In general, because it's just a Web site and it's just HTML, people will tend to under-budget for timing — "It shouldn't take that long to do this." But these things can really be very time-consuming and can really need to be planned accordingly. Not only in terms of time, but also you have your technical team doing your technical development; you have your content team doing your content development; you have your marketing team integrating the messages with the marketing program; you have your graphic designers graphic designing; on and on and on, and you have all these "cooks" involved and accordingly, those appropriately can be very, very important and very, very difficult actually.

Technical assistance is important in things like systems setup. A UNIX workstation is not like a Macintosh. Pull a Macintosh out of a box, plug it in, turn it on, and you get the happy Mac. You're ready to go, right? Not that way with UNIX workstations at all. It's oftentimes very difficult to set them up correctly. If you don't have a lot of experience doing that for something like a Web server, it often pays to hire a consultant just to do that, because if your fundamental hardware platform is not properly configured, if your foundation isn't set and it isn't stable, you can run into very real problems down the line. And you can also run into very real security issues with that as well, if it's not properly configured.

Obviously, technical assistance in terms of CGI scripting for certain types of CGI scripts helps. And it's for any custom system integration too. If you're tying in databases, things like that, it's very useful to have someone who's experienced with the database and experienced with what development to bring the two together in an effective way.

For commercial tools, there are lots of tools being offered on the show floor today and I encourage you to go out and check those out. There are author utilities like SoftQuad's, *Hot Metal* and *Hot Metal Pro*. That's an issue that I mentioned briefly in terms of editing tools. Check them out if you're interested in looking at those. Put them through their paces. Oftentimes, especially with these sorts of tools, you may want to get evaluation copies of them. So get an evaluation copy, hand it over to the Webmaster and see what he thinks of it. If he likes it and thinks it'll save a lot of time, then go for it. If not, then you know that you didn't have to spend all that money on it.

You have content conversion environments, and what content conversion environments will do is take large pieces of existing documents and translate them into HTML. Interleaf has a product called *Cyberleaf* which is actually very, very cool. You can drag *Frame* documents, *Word* documents, *WordPerfect* documents, and a very cute, animated result will pop out in HTML.

There are certain restrictions to know about these, though. HTML is a semantic market language. This is sort of an uninteresting point to debate at cocktail parties, but HTML is a semantic market language as opposed to something like PostScript, which is a literal market language. By literal, it means this word should be at this position on the page, should be in this font, etcetera; it exactly specifies, whereas a semantic market language really specifies things in terms of function: "this should be important; this should be emphasized; this should be important, but not as important as that." And really, that's how it describes your documents.

This is very good because you can get very rich formatting with very little information. You're telling it to make it important, and then the browser decides how to make it important and how it compares to the other ones, versus sending across all this information to PostScript. But it's also a problem because it's very, very fuzzy. You don't have as precise control over how

your content is displayed, so there's a little bit of faith in each [inaudible] you have to have, and a little bit of faith in the browser, [inaudible] to render things appropriately because it's semantic.

Well, when you're dealing with a content conversion environment, what's going on is that you're converting from very literal market languages to a semantic market language, and you're losing resolution in the process. And that can be very problematic.

If you have questions about converting from [inaudible] into HTML... A quote that I had about that was that it's kind of like doing a great reproduction of the ceiling of the Sistine Chapel on a postage stamp with crayons; a lot of information and a lot of detail into something really fine. Yeah, it's a reproduction of the Sistine Chapel, but it doesn't really look quite the same because you're losing so much information. So you have to understand what is capable there and what to expect, and that can present problems for some of the content conversion environments.

Microsoft Internet Assistant is a plug-in to *Microsoft Word* which is free. It will allow you to save as HTML. The last time I used it, it still did a lot of things wrong, so be cautious with that. It does help out, but it can present problems.

What we're seeing now is more and more development on the service-side application. This is time for the shameless plug. We have two of these Netforms, and what that is is universal CGI script. What it does is eliminate the need to create a lot of custom CGI. Where you normally have to outsource or create internally, it automates that whole process. Or *Net Thread* — that is a thread-based discussion application, so you can do host-and-response discussion internally and externally and can provide a lot of power to a Web site. If you're interested more about those, I won't waste any more of your time here. Please do stop by our booth at the show.

There's more and more coming out on this. Some of it is very interesting, and some of it is very droll. But these are server-side applications, tools which compliment the Web server, ones that add sort of value-added features on top of it, but are not the Web server itself. What we're seeing is a steady migration towards that, which is meaning more competition for us as a company, but it is interesting. There are some good tools that are coming out.

Also, things that aren't on here. Very recent developments include things like Netscape's *LiveWire*. *LiveWire* is a complete document management tool and revision control system. They have announced it, but I'm not sure if they're going to be demonstrating it here. I'm not sure if it's fully ready or if it's vaporware. Things like that — there's a lot going on. It's good that this is all going on here.

For conclusion, in terms of the building of a site I went through the technical aspects and touched on some content considerations and the internal costs.

The conclusion for the buying I went through the general requirements, the costs of Internet consultants, and the costs associated.

Then finally for both, internal investment — what to invest in terms of capital equipment. What are you going to buy in terms of hardware? What do you already have available for hardware? What are you going to use for connectivity?

An issue in terms of this is that a lot of companies say, "Wow, it's a lot of money for this T-I if all I'm doing is putting a Web site on." But if you're installing a T-I or any sort of direct Internet connection, you can Internet-enable every single employee; have Internet on the desktop; have Internet e-mail, etcetera. This can open up a whole suite of possibilities for your corporation, of which having internal and external Web servers is only one of them. Also, what are you going to pay for in terms of human resources? Are you going to bring on extra people or are you going to retrain them? [You must also consider] the cost associated with external consultants for the different areas that you have consulted and whatever software tools you

choose to invest in.

Other information sources. If you need to get more, go to existing Web sites. The best place to find good info about the Web is the Web itself. There's a lot of good places out there, and it's also a good way to evaluate different vendors. There are other training sessions, whether they be seminars or giant conferences like this one. You'll see more and more in various metropolitan areas; full-day seminars being offered on anything — introduction to the Internet, advertising on the Internet, how to be a Webmaster, etcetera. Some of them are good, some of them are not so good.

That touches on magazines and journals. *Internet World* magazine and *WebWeek*, which are provided by Meckler, are both very good publications and worth reading.

Also related to that are books. There are millions and millions of Internet-related books out there right now. I caution you to be very, very careful in selecting them. What you'll see is a lot of Internet books which are this many screen shots and which are already out-of-date because their Home Pages haven't been updated from the time that they were published. Be a selective buyer in that.

Of course, I very highly recommend our book. If you want to see a copy of that, it's at our booth. It's a technical book there. What we have done, because we see a real lack in terms of very useful books on Web technology and there being a real need for that knowledge to get out, we actually just got involved with a four-book series deal with Wiley. So expect to see more and more books coming from net.Genesis in the future.

You could also pay for consulting services. We get a lot of requests — and we don't do it — to come in and train corporations. You can say, "You know, look, we want to pay for a day's worth of your time for you to come in and teach it to our people." And I'm not going to be very useful because what you can do is say, "Come teach to us, and these are the things we want to know." So you can very clearly up front specify that you want to know this sort of information and then make sure you get the most value for your time — as opposed to attending a general session like this one, which I'm sure had things that were useful and things that were not so useful.

WORLDWIDE WEB DOOMED TO FAILURE: UNSUCCESSFUL WEB SITES



MODERATOR

Kenneth Lane

WorldWide Web and On-line Information Consultant

SPEAKER

Jim Sterne

President, Target Marketing

Kenneth Lane: Good afternoon, ladies and gentlemen. Welcome to our first session of the afternoon. Mr. David Bunnell, who was supposed to be here to do this session, had a last-minute emergency and will not be here. However, we do have a very interesting speaker replacing Mr. Bunnell; his name is Jim Sterne, and I'll just give you a little bit of a background [on him].

Jim has spent over 15 years in sales and marketing of technical products. His unique brand of consulting focuses on product positioning and product presentation. Jim began his career helping people understand VisiCalc at a time when the personal computer was an oxymoron, and he successfully described sales-ordering processes to people using hand-cranked calculators. He was at the forefront of the computer-aided software engineering revolution, and has clarified the salient points of object-oriented programming. For the past two years, Mr. Sterne has devoted all of his attention to the Internet marketing medium. He has gathered information at conferences, on-line discussion groups, and from his own experience as a founding partner of a regional Internet access provider.

One year ago to this day, the National Center for Supercomputing Applications, NCSA, released the first public version of its graphical WorldWide Web browser, *Mosaic*. Target Marketing launched marketing on the Internet, as well as a seminar series — the first of its kind, an educational event which included five speakers and was delivered in five major cities.

Mr. Sterne stays active in a consulting capacity, helping each client set Internet marketing goals and determining strategies. He offers unique creativity in the design of an on-line corporate presence, with an eye towards engaging the viewer.

Just as a little addendum here... Mr. Sterne also has a new book which was just released by Wiley & Son, called *WorldWide Web Marketing: Integrating the Internet Into Your Marketing Strategy*. I believe Wiley & Son is here, and you may be able to pick up a copy at their booth.

Without further ado, Jim Sterne.

Jim Sterne: Thank you very much. When I was called on Thursday and asked if I could provide a presentation on this topic, I thought, "Doomed to Failure!" But here I am anyway.

It's a great subject to think about, because we're all nervous about getting out there, putting ourselves out in a publishing position out on the WorldWide Web and being afraid that we will be doomed to failure. So I'm going to try to provide a couple of pointers to show you what not to do, and to help you have a presence that is a corporate asset instead of a corporate embarrassment.

Here are the five issues. These are the top five ones, and I want to go through each one of them specifically: not putting together proper goals; not putting together proper plans; not taking advantage of this fabulous technology; insufficiently promoting your site; and not focusing on the fact — the main point, the big deal — [that] this is a communication medium, not a broadcast medium.

So, what's an unrealistic goal out on the Internet? There has been a lot of hype, and

those of you who heard the keynote speech this morning heard the question [that] maybe we are under-hyping it. Well, maybe; but for the most part those of us who have seen the ads and heard the radio commercials for the \$29 seminars — where you don't need any computer experience, you don't even need a computer, you can make money fast on the Internet — we're a little nervous about the hype.

These are unrealistic goals. It's unrealistic to expect that you can simply broadcast your message out to 50 million Internet users. It is not a virgin, untapped market; it's a bunch of people whom you are already reaching through newspapers and television and direct mail. Now you [only] have a new channel for each of them — so they're not new, they're not untapped. They're segmented — that's [a] good [term]. But you're not going to reach everybody all at once.

[The Internet] is not going to let you give up on all the other forms of marketing that you do. It's not going to let you say, "gee, we can stop doing direct mail, we'll publish once on the Internet, and everybody can see it." No — it's in addition to. That means, yes, you have to dig in your pocket and come up with more marketing dollars to support this thing.

It doesn't sell product automatically, or "automagically," as I put it here. You're going to have to use common sense, good marketing skills, and good sales skills just like you do in any other medium; but you need some new skills for this one.

You are going to make money on the Internet. You're not going to do it fast. But the real issue here is that the growth is so exponential, and the opportunities that are available are growing so exponentially, that there is a niche somewhere for each and every one of you — especially because you have to stop and realize that this is the early days. This is new; this is at the time when people used to take their newspaper pictures and their radio copy and put that [together] and call that television. There's a lot we can do on the Internet that we haven't even guessed about yet.

The Internet is not a replacement — you're going to have to do all of your normal marketing anyway. It's not stand-alone. You need to do this sort of work on the WorldWide Web in conjunction with the rest of your marketing. You have to tie it in with the rest of your corporate message. You have to tie it in with the events that you're doing, the sales that you're offering, the general marketing that you do, [and then] make sure that the Web is part of it, not separate from it.

The Internet is not a place full of people who are ready to buy anything that comes along. These are not people who are just sitting around with money in their pockets; these are very intelligent users, and you have to treat them intellectually.

And finally — and most importantly — it's not a broadcast medium. Television lets you broadcast a message. Now, what does that mean? Right now I'm broadcasting to this audience; you're sitting in the audience, you're in listening mode, you're letting my words wash over you. Hopefully every now and then one of them will stick, but you're receiving. On the Internet, on a Web site, you interact, and you're taking part in what I present on a Web site. It's an important difference.

There are a handful of realistic goals that you can put together into your marketing plan. It is definitely possible today, with today's technology, today's audience, today's Internet, to sharpen your corporate image. It used to be that you get a Web site up on the Internet, and boy, and you were cutting-edge — you're a leading-edge company, you know what's going on. Today we're at that place where, if you have a Web site, that's pretty neat. Tomorrow, if you don't have a Web site, you will be conspicuous by your absence. "You mean you don't have a fax number? You don't have voice mail?" It's going to happen very quickly. So you can sharpen your corporate image today by getting a Web site, and keep from tarnishing it tomorrow.

Improving customer service... That's probably what makes my heart flutter when I look

at the Internet. The ability to allow your customers to reach into your company and help themselves is fabulous. It's tremendous. We've never had an opportunity like this since the dawn of the 800 number; inviting people to come in and answer their questions, give us their opinions, and become part of our corporate family — the bonding with the customer.

[There's a chance for] heightened brand awareness, certainly, and to qualify prospects, definitely. Those of you who have technical products, long sales cycles — your sales people spend more time in education than anything else. Get the Web site running. Your prospects can come and teach themselves at their own pace and their own time, when they're ready to receive the message, and your sales people can spend their quality hours, their expensive hours, on-line closing the sales.

And of course we want revenue to increase, so yes, you can sell products. You're not going to make a million. You're going to put up a Web site, and people are not going to rush to it and buy things from you just because it's there.

You have to be very marketing-savvy about what your Web site looks like, and how it acts and how people interact with it. It's creating that open, electronic dialogue with people that's going to hook them, excite them, keep them at your site and get them to come back.

Another thing that dooms a corporate Web site to failure is the lack of planning — the, "Hey, let's put up a Web site! Let's put up a Web site, and it doesn't matter if it's under construction, everybody knows that everything is just fast and loose on the Internet..." When was the last time you created an eight-page, four-color brochure and the last two pages were blank? Don't do that! Don't do that on the Web. Don't make it under construction. Don't offer something, "click here for good information," and they click on it and it says, "come back next time." Don't do that, [it's] bad marketing.

You need to plan several different stages. First of all, what's the front-end going to look like? What is it that the person is going to see? You have an opportunity to create a graphically-rich, media-rich environment, but you have to do it carefully and consciously because we don't want to overload people's 14.4, and now 28.8, modems.

And just as you have to do graphics carefully, you have to write your copy even more carefully. The studies have shown that people read faster, with less retention, and are less inclined to read a lot of text [when it's] on a computer screen. They want the information quickly. So they're going to read 50% less, and you better write 50% less. Make it short and to the point, so that people have the opportunity to drill down to where they want to.

Don't give them a Home Page that has your whole corporate story on it. Give them an opportunity to learn on their own, by digging. That doesn't mean make a thin Web site; make it deep, but don't put everything up on the top layer.

Professional layout is going to allow people to access your information. If it's got a nice format to it and it's easy to understand, people will use it, come back, and be delighted to be there. You also, for the front-end, need to think about what your map is going to look like. How deep does your Web site go, and in what areas? Well, there's what I call the usual suspects.

You go to anybody's Home Page, and you'll find "About the Company," "The People at the Company," "About Our Industry," "What's New," and "Our Products." Now, when a visitor comes to your Web site, and they see "About the Company," and the mission, the history, the different divisions, and the charity work you do, it's almost as if that area of the screen is invisible. Nobody cares what your corporate mission is. People are sort of interested in people, so they'll go to your contacts area to see how to get in touch with the right person. They're interested in your white papers; if you're putting together an offering of information, for free, about what you think is going on in your industry, people will read that. They're interested in your perspective, because frankly you know more about your industry than they

do. You're a source of information that's useful to them.

The "What's New." If you put up the "What's New" bug and let people click on it, they will go there. People are curious; they want to find out what's the latest and greatest.

But by far the most often visited place on anybody's Web site is "Products." People are not there to win prizes, and they're not there to see your nifty graphics; they're there to learn more about your products while they're making a buying decision. Make that area deep, and plan your map. Sit down and do the usability study, so that you can tell, "is this the logical place to put that information, and are we presenting it in the correct order?"

You're also going to need to work on planning the back-end. On the back-end, you've got data collection happening. People are coming to your Web site and logging in and reading about your company; but you know that it's an interactive medium, so you're creating forms and you're collecting information about them.

What do you do with that information? How does that flow through your data collection system? How is it stored in your database? What else are you going to do with that database? Work out the flow chart, and work out the database design so that you know ahead of time what questions you are going to ask of that database as you start collecting the answers.

Finally, [I want to talk about] the ties to the corporate systems. Federal Express is probably the first one out there that really provided end-user access directly to their corporate database. "Where is my package at this moment in time, when was it delivered, who signed for it?" That's reaching into the glass house, that's opening up the corporate data center to the Internet. People are going to expect that more and more. That takes some very careful planning, some serious planning, some security planning.

Well, all of this sounds like it's going to take more than \$50 a month to hack together an HTML page, so maybe we ought to worry about the resources, and we ought to plan on what we're going to spend.

We're going to have to hook up to the Internet somehow. Yes, you can buy a \$50-a-month Web page; yes, you can spend several million dollars on your Web site. We've seen both examples. Getting connected to the Internet can be easy and quick; or you might need a large connection, in which case you're dealing with telephone companies, [which are] not known for turning on a dime. Plan for that. You need to plan the hardware that you're going to provide, which is dramatically inexpensive; a very nice Sun workstation, a very nice Silicon Graphics machine, a very powerful Hewlett-Packard machine, and for \$15,000 to \$20,000 you can have a very nice Web server. But you better find someone who is going to come up with the budget for that. There's also some software you'll need to do, and you'll also need to think about the people [you'll need].

Now, the people that are needed are a really interesting category, because there is nobody that has five years' experience creating Web sites, so you really have to judge talent. You really have to go to your competitor and steal their top people, because there are very few folks.

In fact, I was reading in — I think *TIME* magazine — [which] said that right out of college [there are] people who have HTML experience, are UNIX savvy, and understand a Web site, and are garnering \$90,000 to \$110,000 right out of the box. Three years from now that won't happen any more, because there will be enough people who can do that, and enough tools so that the rest of us can do it. But today they're expensive. Plan on it; expect it.

The kinds of people you need... Somebody has to create content. Somewhere in your product organization — the product marketing manager, the product development manager — somebody there knows enough about your product to know what information is necessary, what order to put the information in, and [then] deliver it and say, "okay, put this up on the server." Before it goes on the server, though, it better go through the filter, [to check for] the

corporate communications, the corporate identification, the corporate logo, the corporate color — the filter that says this is the style that we use in this company.

Now, once it gets through that filter, it can go to your technical staff, who are the servers. This is our technical server. Your technical people are going to have to be network-savvy, they're going to have to be Web-server-savvy, and they're going to have to understand how to work with end-users, in this case the marketing department. Plan on having a group of people from all over the organization who are going to work together as a team. There is no organization within your company that can do this alone; it's a team effort.

When we talk money, we also have to talk time. For some companies, this is a time-line in weeks, this getting your strategy together and planning out your implementation. [Then] there's a three-week fight over who owns your Web site. Does it belong to IT, does it belong to marketing, does it belong to corporate communications, does it belong to your PR agency? You better plan some time to work that one out.

Access is a long process, because again that's out of your control. You're waiting for the phone company or your Internet access provider to show up with a T-1 in hand. That doesn't happen instantly.

[So you're] designing, prototyping, and then right away you'll want to start creating content and validating that content from a marketing perspective and a technical perspective. In other words, if you give me a picture of the product, can I properly put it into a form that can be seen on the Web?

And then testing, testing, testing.

Those are processes that will continue forever; and just when you think you've got [things] organized, it's time to look at your strategy and your planning [again], because this world moves fast.

Another way that Web sites are doomed to failure is by not utilizing the technology that we have. This is the dirty little secret about publishing things on the Internet: that it's a lot of fun. It is. It doesn't take much to do a little HTML and throw it up on the Web — and look, everybody can see it! Well, the problem is that if you don't put enough technology out there, you end up with some problems.

I decided to pick on the National Business Incubation Association. I hope there's nobody here from that association today... Good. [This one's] doomed to failure. Folks, [let's say] there is a graphic [you designed]. It's probably a beautiful logo. [But what if] we can't see it, or you named it wrong? Fix that! [What if] it's a spelling mistake in your brochure? Don't let it go out the door.

They have a list of members in alphabetical order, which is very useful for those of you who know the name of the company that you're looking for. If you're looking for a particular type of technology, you get to click on each one of those to find it; [though a] little bit more organization would be helpful.

Well, let's go visit some of these. Let's start up in Canada. Now, the Canadians decided to do a text page; they didn't quite want to get to the graphics or the layout, or the enhanced-for-Netscape stuff, but they gave us a link. Isn't that nice? There's a blue spot, and we can go and press that button.

When people come to your Web site, they're not there to read about you, they're there to find out what they can do. They want to know what buttons they can push. Here's a Web site — what can I do? Where's the blue spots? [You need] one blue spot — it's great from the control perspective.

Here's a company that said, "ah, out in Long Island? We can pick up a picture. Let's put up a picture of something that everybody wants to see — our building!"

The Boulder Technology Incubator said, "oh, we know how to make the background

white.” They get three points.

High Technology of Rochester said, “oh, we know how to put in a colored background.” Pretty nifty Netscapism.

These people have a banner up at the top. That’s pretty good... Their logo is there, [and it’s] pretty catchy. And look, bullet points. Three-dimensional bullet points — these people are really getting sophisticated.

Ah, a colored background. These people actually took a picture and made it into tiles; boy, that’s enhanced for Netscape. That’s terrific.

There was one place in that list that had an interesting-looking Web site. It’s in Germany. They figured out Netscape, how to label things, [how to create] nice graphics; at the bottom [they had] a Netscape I.I, enhanced for maximum viewing pleasure. The country that gave us Fahrvergnuegen now gives us Surfvergnuegen.

This was my favorite of all of them — this belongs in the *New Yorker* magazine’s “Web Sites We Never Finished Reading.” [It’s the] Technology Development Center Fact Sheet. Who are we? I don’t care!

I went to *Yahoo*, and when I searched for Incubator I came up with the all-time worst Web site. Don’t ever, ever, ever do this. This first one is the NASA Johnson Technology Communications Center. 404... File not found. Shame! All right, also doomed to failure.

If you over-utilize... We all love to pick on *Hot Wired* magazine; who am I to differ? Actually, this is pretty well laid out. It’s a little bit difficult to read — I admit to being over 40 — but at least it’s not as bad as hyper-fuzzy. You know that when you go to the enhanced-for-Netscape Hall of Shame, and their number one pick is hyper-fuzzy, it’s a great example of what not to do. If anybody can figure out what this site is about, and what it stands for, and what those buttons are, send me some e-mail, will you?

Insufficient promotion is one of the largest things that will doom a Web site to failure. If you don’t let people know it’s there, they won’t know it’s there. You can go out and announce this thing, this new Web site or new additions to your Web site, in on-topic, specific newsgroups, in [the category] “Announce Newsgroups and Web Sites.” But many, many words of caution — well, a big caution — [use] few words. Do it carefully!

If you’re going to go to a newsgroup and announce that you have a commercial Web site available, you better be familiar with that newsgroup. You better have read their introduction; you better have read their “Frequently Asked Questions.” And you really ought to have hung out there for a couple of weeks and read the posts to know what the local culture is. We’re not talking general netiquette or general culture; we’re talking very local, specific newsgroup culture. If you do that wrong, it will hurt you a lot more than if you don’t announce at all.

There’s also some help you can get in announcing your Web site. This is a company, Submit It, [where] you tell them the description of your site, and boom, they send it out to dozens, soon-to-be-hundreds, of different “What’s New” pages.

There’s another one called *Postmaster* that does the same thing. There’s another company called Netpost, [at] netpost@netpost.com. [Eric Word] does it very personally. These are automatic systems; you type in the descriptions, and it forwards them. [It] saves a lot of time, but doesn’t tune it. [Eric Word] will go out and tune your message to the right list, to the right newsgroup, so you can farm out this activity.

You can also buy links. You want to take your little logo and sprinkle it around the Internet? Great, open your wallet. Netscape is charging \$14,000 a month; *Hot Wired*, fifteen; Prodigy, sixteen; and NCSA will only cost you \$30,000 a month to advertise on their page.

This morning I talked to Glen Davis, who runs the “What’s Cool: Cool Site of the Day.” He now is very pleased to say that he has the highest per-thousand-dollar value for advertising.

He started taking advertising three weeks ago, and there has been a bidding war for space on Cool Site of the Day. Get your bid in early, and bid often.

Also, [about leaving] your [electronic Web site] signature... Now, I'm assuming that some of you have outside activities [other] than work — I think there may be two of you out there today. If you post things to alt.recreation.bicycles.racing, it's okay on the bottom to have a couple of lines that say, "by the way, we make the best bicycle tires on the planet, check out our Web site."

In fact, if you post to rec.pets.dogs.health to find out how to cure your dog's fleas, you should put, "we make the best bicycle tires on the planet," and [list] your Web site. Why? Because a signature is okay. The message above the signature has value; the signature itself is innocuous. But it clues people in that there is something else to go look at.

Why is it important to make sure that that's in an off-topic newsgroup? Because *Deja News*, and *InfoSeek*, and *Yahoo* and *OpenText* are going to be able to scan those. So when I go look for bicycle tires, I'll get this posting about some guy who is worried about his dog's fleas. "Oh, look at the signature. Bicycle tires; that's what I was looking for." It's a way of getting your keywords out on the Internet.

Keywords also belong on your Home Page. Let's say you sell shoes. Shoes, sandals, Bostonians, slippers; there's a lot of words for shoes. And if I type in "hiking boots" and you don't have hiking boots on your Home Page, I don't see it. How do you get hiking boots on your Home Page?

Well, programmers know that there is something called "the comment." The comment in your HTML is a piece of text that is not seen by the viewer; the browser ignores it. So you can have a long list of keywords that are commented out, [but are] still there; and when the spiders come — *WebCrawler*, *Lycos*, *Yahoo* — when they come to look, they'll see those keywords, and they'll store them in their database and people will be able to find you easier.

And [then there's] traditional marketing; I can't stress it enough. Go out there and market as you would anything else. If you have a 1-800 number and you don't tell anybody, you won't get any calls. Make noise out there, through direct mail, on TV and the radio, that, hey, folks, we're now available through the Internet at www.company.com.

This last item is one that I think we're going to see more and more and more and more and more. The reason that people get on the Internet [is because] you're supplying some value-add that is interesting enough and sufficient enough that somebody is going to say, "you know, okay, I'll get on-line so I can have that." They'll say, "I'm willing to finally take this 493rd America Online diskette that has shown up in my mailbox," or "I'm willing to take this diskette that I find in the glove compartment of any Volkswagen," — [because even] they're shipping them now — "put it in my computer, and it will take me on-line, it will give me seven days of free access to the Internet..." And it will take me directly to the Volkswagen Home Page.

CompuServe now has a service where they will brand your own browser for you, stamp it into a CD, and allow you to mail it out to all of you your customers.

Now, if you have something that is compelling, that is valuable, that is content-rich and interactive and really provides a service and helps somebody get their job done — not just selling T-shirts, but actually helping somebody in their day-to-day tasks — they're going to say, "oh, I can access company.com, and I will." Not, "ooh, I want to surf the Internet, man."

No, [that's not what they want]. "I want to contact that company, and do that transaction." Or, "I will use this diskette to contact Federal Express so I can track my packages, because I'm the shipping manager, and that's what I do for a living and it's worthwhile." [And then], "oh, by the way, I now have access to all the rest of this Internet stuff." Your job is to think of what you can provide that is valuable enough and interesting enough to compel people to get on-line. Let all this surfing take care of itself.

The last one that will doom a Web site to failure is the “Company Publish” model. Company Publish says, “look, we’re on the Internet, isn’t this cool. We have a Web site, aren’t we great. Learn about our company, learn about our CEO. Oh, by the way, we have some product stuff over here, but, oh, look at our new building. Oh, meet our head of human resources...”

People don’t care about that. Some people are interested in your annual report, but not everybody. They’re interested in your products. Although I have to admit, there is a time where it’s important to put your CEO on there. John Patrick, who is head of the IBM Web Initiative, tells the story about going into Lou Gerstner’s office and saying, “look, this is the WorldWide Web, isn’t it neat?” And Lou says, “well, yes, that is pretty neat.” And [then John Patrick says], “and seeing that we have a picture of you, we want you to be on our Web site.” “Oh, gee, that’s very neat,” [Gerstner answers]. “And Lou, we want you to speak this little speech into this microphone right now — ‘Hello, I’m Lou Gerstner; welcome to the IBM Web site’...”

The next day there was an all-manager IBM meeting, at which they gave a demonstration of what would be IBM’s Web site — including a big picture of Lou Gerstner saying, “we’re going to be a leading force in the Internet industry.” [It was] amazing how quickly they got all of those managers from IBM on board, just like that. So sometimes there’s a reason to have your CEO on your Web site.

The fact is that the Internet is giving us access to our trading partners like we never had before. Customers want access to information about your products; they also want access to information about the process. “Where is my shipping order? How long is it going to be back-ordered? If I change the color to green, can I have it tomorrow?” They’re going to want to get involved in your policies, they’re going to want to get into your management’s heads, and they will have the power to respond to you directly and instantly. They are going to expect to have access to your company; prepare for that.

If all you do is put up a brochure, you’re not going to make it. It’s your responsibility to focus on customer service, to focus on the interaction, and to remember that this is not your brochure, this is your customer’s experience. It’s them sitting in front of the terminal, saying, “what do I want?” not “what does the company want to tell me?”

So pay attention to these things, or you too can be: “Doomed to Failure.” Thank you very much. And we have some time for questions.

M: [inaudible]

Jim Sterne: Is all this stuff on my Web site? By the end of the week it will be, yes.

M: [inaudible]

Jim Sterne: Have I seen Mirsky? You know, I really wanted to spend about two days... People should know there’s something called “Mirsky’s Worst of the Web,” and it is a little more entertaining than the Enhanced for Netscape Hall of Shame. Well worth the time, to learn what not to do. Thank you. Any other questions?

W: [inaudible]

Jim Sterne: The question is [about] using keywords on your Web site; if you haven’t done it yet, is it too late? No, it’s not too late, because the *WebCrawlers* and the *Lycoses*, their job is to go out over the Net all the time, because Web sites change on a minute-by-minute basis. They’re not going to survive if they take a picture of the Net this Thursday and it still looks the same

next Thursday. So go ahead and do it now, it's not too late. Any other questions? Yes.

M: [inaudible]

Jim Sterne: The comment is that all of these graduate students are coming in, and they have a lot of Web knowledge and UNIX knowledge — that's terrific, they need them — but they don't have the business knowledge. The solution for that is teams. You need to have the young, excited, live-on-pizza-and-Jolt-cola folks to do the work and understand it.

By the way, find somebody in your company who is willing to have as part of their job description Web surfing, to go out there and look. I mean, people in your marketing department go to a trade show; what's the one most important thing they do, besides meeting with the press and trying to sell your product? It's collecting brochures from everybody else in your industry so you can see what they're up to.

Do that on the Web. Create a team of people that has the Web surfers, the young, talented techno-geeks and the gray-haired, business-savvy folks, and force them to learn to get along together. If they do it successfully, it's going to be "Not Doomed to Failure." Any other questions?

M: [inaudible]

Jim Sterne: The comment is that your corporate library may be out there doing research for you already that you don't know about. This is a key point. Your corporate library probably is staffed with people who have doctorates and advanced degrees in library science; these people are golden. They can find things.

When the CEO comes down and says "I need a competitive analysis by 3:00 this afternoon," go to the people with the library science experience; you'll be amazed what they can do. Good comment, thanks. Yes.

W: [inaudible]

Jim Sterne: What's my most compelling reason, when I talk to my customers, about why she should not put the CEO, and the building and the mission statement up on the Web?

Diplomatically? The most compelling reason is that it does not further the strategic goal of having a Web site. Number one, first thing out of the box — why do you want a Web site? "We want to accomplish this." Explain to me how a picture of your CEO is going to accomplish that, and I'll buy in. Otherwise, I don't see it.

M: [inaudible]

Jim Sterne: The question is how do you convince a hundred-year-old, department-store kind of a company that is focused on profits and on selling that this is a different paradigm, and that you have a communications problem to deal with instead of a salesmanship problem? Well, obviously, John, the answer is — hire a consultant!

It takes a lot of convincing. It is a new thing; it's different. But probably the most compelling way to do it is to find a Web site that you think has done a real good job, and put your management in front of them, or put your management behind the seat of somebody else who is visiting that Web site, and let them experience what happens to somebody when they really interact instead of just reading [something] or getting sold to.

The fuel to the fire here is [the attitude], "gee, nobody is making any money on the

Internet,” so the managers and the VP’s are disinclined to put any resources into it. I would say that that was last year’s news. Starting January 1, 1996, I don’t think you’re going to be hearing people crying that any more, because we are learning how, and we are successfully selling more, so that it offsets the costs, and we are saving money on customer service, which [also] offsets the cost.

We have time for one more question.

M: [inaudible]

Jim Sterne: How would I modify this model for nonprofits? A nonprofit is in the business of solving a social issue. That makes you the key source of information about that issue. If you become the resource, the electronic resource, of that information, it will attract people to your site. Then, I’d say to go to the commercial world and do the tie-ins, just like on TV during pledge week, “here’s a book you can have if you pledge so much, here’s a tote bag you can have if you pledge so much,” and get commercial on it.

Thank you all very much.

WORLDWIDE WEB THE TRIALS AND PITFALLS OF BUILDING A WEB SITE IN A CORPORATE ENVIRONMENT



SPEAKER

Kenneth D. Lane

WorldWide Web and On-line Information Consultant

Kenneth D. Lane: Good afternoon, ladies and gentlemen, and welcome to the second of this afternoon's sessions, which is going to deal with the trials and pitfalls of building a WorldWide Web site in a corporate environment.

This session will cover the planning, design and development stages of building a WorldWide Web site, and how these issues need to address the politics and culture of the corporation — that is, the importance of getting the organization's key players to buy into the plan. During this session I hope to answer some of your questions; but more importantly, I hope to be as provocative as possible so that you will begin asking questions, and hopefully arrive at conclusions by answering many of these questions on your own.

This will be an interactive multimedia presentation; by that I mean that you will be able to see me and hear me. It's also going to be interactive because we will have questions and answers.

The format will be about 40 to 45 minutes of presentation, and at the end we'll have about 15 minutes for questions and answers.

Just as a reminder, for those of you that are trying to take notes, there will be an audio tape available of not only this but all the presentations, and at the very end of the conference there will be a CD available with the entire proceedings from the entire conference.

(Plane flying over)

Murphy's law. I will be talking about Mr. Murphy quite a bit this afternoon. Information about those items can be found up by the registration area, for those of you that have some immediate interest.

In many corporate environments there are probably competing or diverse divisions, some of whom are very Web-savvy, most of whom are not; some with over-inflated opinions or exaggerated notions about what the Web will do for your company, and some with very realistic expectations.

So, let's meet this first issue head on. Just what are your reasons and expectations for building a WorldWide Web site? This may seem like a no-brainer for some of you. The competition is there; we want to use the Web as a marketing tool; we want to save money; we want to conduct business over the Internet; we want to be philanthropic.

All good, sound reasons for wanting to build a Web site; and for those of you who are not sure, let me share with you some recent demographic information gathered by *Yahoo* at Stanford University in a recent survey.

For those of you who may not be familiar with *Yahoo*, *Yahoo* is probably one of the best sources for locating information about sites on the Web. At last count, there were over 30,000 links to sites that you will probably want to check out.

Of course, there are a number of other site locators, such as commercial services on the Web, *WebCrawler* and others that you will also probably — if you haven't already — want to explore.

Copies of the *Yahoo* survey can be found right up here afterwards if you want a copy to take back and stick under someone's nose. They are available here, as well as on their site.

If anyone is interested in participating in another survey, if any one of you are participating in another survey that they're about to begin, you can e-mail them at survey@yahoo.com.

In terms of demographics, here is how the questions were answered. Each percentage is based on the total number of people who answered that particular question; and I might add that 67,000 responses were received as part of this survey in less than a week's time.

The first question was, in what part of the world do you live? The USA came in at number one, at 76.4%; and then it starts narrowing down. Canada was next at 8.6, the UK at 2.9, and so on.

So as you can see, your primary ADI, or "area of dominant influence," is in fact here in the U.S.; but don't overlook some opportunities abroad.

Are you male or female? Male response, 83%; female response, 17%. First pitfall — don't fall into the trap of being misled by this, or any other single source of market research based on this kind of response. If you were to evaluate the male/female ratio of connectivity to what we in the industry call "primary on-line services" — services such as CompuServe, America Online, and Prodigy, as well as the professional on-line database services such as Knight-Ridder Information Services, Lexis-Nexis, DataTimes, and a number of others — you will find that the number of females is going to be closer to 50-50. In some cases possibly 55-56% of your on-line audience is in fact female, so you don't want to overlook this potential in the market.

How old are you? Less than eighteen, 7% — there goes Al Gore's theory, right out the window. Eighteen to 35 years, 54%. Thirty-six to 54, 34%. Fifty-five and older, 5%.

This demo, by and large, is very impressive and holds fairly consistent with a lot of other data that I have seen. Why? Because most companies who market and advertise in mainstream media try with all their heart and soul, activities and dollars, to reach this market.

For example, the 18-35 age group represents purchases of durable goods, automobiles, homes, the big-ticket items. The 36-54 age group represents a higher level of disposable income — the adult-toy market, if you will — the expensive computer, cellular telephones, in-home theaters, dining out, expensive vacations, and other such discretionary income spending.

What is the highest level of formal education you have completed? Grade 12 or less, 7%. High school, 22%. Bachelor's degrees, 37%. Graduate degrees, 27%. Others, doctorate and above, 7%. This is a well educated, knowledgeable group, so don't talk down to your audience. Enough said!

What is the marital status? Single, 54%; married, 46%. Inconsequential? Maybe, maybe not. This almost 50% statistic may provide opportunity for some vendors who have goods and services that appeal to either or both of these audiences.

What is your current profession? Managerial/professional, 42%. Students, 23%. Technical, 19%. Academic, 8%. All others, 8%. Obviously it's a large segment of professionals who are making or who are influencing buying decisions.

What speed is your primary Internet connection? Less than 14.4, 6%. 14.4 and above, 44%. 28.8, 17%. 28.8 to one meg, 10%. One meg and higher, 8%. Others, 2%. 13% didn't know how fast they were going.

These statistics can also be a bit misleading. Although many of these individuals surveyed may have had home modems that operate at those speeds, if they are using on-line services such as CompuServe, America Online or Prodigy, the best connect that they're going to get right now is 14.4, if they're lucky. More than likely, 19.2 is the highest rate of speed that those services are providing at this point in time; tomorrow it may be a whole different picture. So here's a good reason why design is very important.

The speed at which most users surf the Net is, in fact, one of the most important issues in your first elements of design. Don't use gigantic graphics, or colossal graphics and maps that fill the entire screen, or even too many graphics that might look impressive to you and your art department and all your people inside. If they take too long to download, you'll frustrate any visitor that comes to the site, and more than likely they won't come back.

And I want to share with you a little story. When I was looking for some information on the Web personally, I happened to visit a publisher's site, and zeroed in on a particular title that I had some interest in.

On the first page-level down from their Home Page, in getting that information, there was a photograph of the author which took up about 25% of my screen. So I waited and waited and waited, and it was a bio on the author, very nice. At the bottom of the page it had a link to some of the information that I was looking for: table of contents, preface, bibliographic information and such.

I go to the next page; the same photo starts unwinding on my screen. I'm waiting and waiting and waiting; got to the next level, and the photo is there again.

I rarely send hate mail to anyone; in this case, I did. Sometimes I write it and don't mail it, but in this case I shot off a letter and e-mailed it to the publisher, and shared my view.

Now, having done some writing myself, I know authors have big egos, and they love to have their picture out there and they love that you know all about them. However, as a user, I don't need to see that photograph three or four times. So keep this in mind when you're in your development stage.

The next question was, what is your level of Net experience? Beginner, 27%. Intermediate, 52%; advanced, 21% — whatever the hell that means, "advanced." I'm sure these people may have started a good many years ago, when there were just Gopher sites around and you had to navigate through some sort of special coding on a UNIX platform. This, in today's market, is obviously no big issue.

But one thing you want to do is to make your site easy to navigate and as interesting as possible. Use menus with hot links, so that they can go logically from level to level. And you want to take your visitor on a tour using these links.

Some of you might even want to consider a "search entry" if you're going to put up a lot of content. If you're going to plan ahead for your database up there that's going to have all kinds of information in it, you want these people to be able to get to your information as quickly as possible.

How many hours a week do you typically spend on-line? That was the last and final question, I believe. Zero to five hours, 28%. Five to 20 hours, 55%. More than 20 hours, 17%. So we're dealing with a group of people who obviously spend a lot of time on-line compared to traditional on-line services such as CompuServe and AOL and the like. These numbers are quite impressive.

This is probably one area that's going to increase more rapidly than the other categories, because as connectivity providers with increased service, more nodes, more connectivity, and then even more providers come on the scene at a more competitive price, you will see vast numbers of increases in this service, because obviously — my phone bill last month was about eight hundred bucks, most of which was on-line time.

So as this price structure becomes a little bit more manageable for most people, they will be spending more time on-line. And if they're newbies, they're certainly going to spend a lot of time. They're like children with new toys. "Oh, look, mom, I can do this." And the wife is leaning over and says, "Hmm, that's nice."

So now we have some hard data at this point that might provide some insight about who uses the Web, and why you might want to reach your market via the Web. But before you

start chasing your tail, or before everyone in the company starts chasing your tail — some of whom may even want to bite it off, or some other area of your anatomy — it's incumbent upon anyone who is considering building a Web site, or who may have one under construction, especially those of you that are committed and are in the line of fire, that there is a clearly defined mission that covers all the right and realistic reasons for building a Web site in the first place.

Now, for those of you that were here for the last session, I may be echoing some of this all over again; and if we are of one mind in sharing the same intellectual consensus, then there's got to be some validity to this.

Over time, your mission might, of course, change, expand or contract depending upon your company's situation; but you certainly will want to start from that perspective, and also address such issues as expectations versus realities while you're at it.

With the diversity of opinion in most corporate settings, it might be a good idea to bring all the departments or divisions together for a meeting of the minds, to hammer out this vision of your mission. The group should include division heads, department managers, your systems people; anyone that might be involved not only in the design, concept and staging of your initial Home Page, but the on-going process as well. [Also] information managers — the librarians that Jim spoke about a little earlier. So, anyone and everyone who will be involved with that process at any stage of the game should be in on these early meetings.

You might want to follow these basic steps to “operationalize” your mission statement. Craft the statement that answers three basic questions.

What business activities will we be involved in down the road, in say, one, three, and five years? We are talking a long-term commitment here; in most cases, to sell this to management in terms of resources to build a Web site is going to be difficult to do, because you're not going to see that kind of return immediately. So you really have to look at the big picture in long terms.

[Second,] what are our objectives, and [third,] how will we reach our goals?

Once you have established the answers to these you need to communicate this mission throughout the entire — and I mean the entire — organization, down to the receptionist. That individual has to know, if a customer calls and inquires about your Web site; that individual should be at least in a position to give them your address, and to know that you have a site available; not something like, “Oh, we have a Web site? What's a Web site?” You certainly don't want that to happen when a customer or a potential vendor or a partner may be on the line inquiring.

Then you need to translate key elements of this position into relevant performance objectives, for employees at all levels. Typically, a statement might read something like this: “The primary mission of, quote” — let's call it the on-line services department — “is to enhance and expand the capabilities of such-and-such divisions to acquire, develop and market products electronically.” This could be the bare-bones core of your mission statement.

Then you need to take that a level down. “Through innovative uses of the Internet, and other related on-line services” — which we may become involved in later on — “we will reduce costs by providing low-cost electronic access to marketing and other information, supplemental software, tools, etc.,” whatever it is that you're going to be giving away.

Teaching aids accelerate the integration of the Internet marketing and electronic publishing techniques into your acquisition, marketing, and distribution process; provide a testing and marketing research platform that will help to gauge the market for fee-based electronic products and services, and promote the acceptance of on-line electronic technologies as a marketing and distribution vehicle amongst the divisions or sales organizations within the company.

Now, that typically addresses a lot of issues, and of course I'm using an example from a publishing industry, which may not suit your particular purpose. However, it gives you some focus as to some of the major points that you need to develop as part of this mission.

Once realistic agreement on mission is established, one that will meet the needs, interests and desires of the company as a whole, only then should you embark on this venture; and hopefully it will not be as perilous as those of you who have jumped in the water without doing this first.

Now, here's where documentation is going to play a very important role. Always, and I mean always, document every meeting and functional activity; then copy everyone that was there. If someone for one reason or another was not there at a particular meeting, make damn sure that they get a copy of what went on at that meeting. And do this for every functional meeting, especially where concepts, tasks, or time-lines are discussed. If there are some misunderstandings, that documentation will help to clarify it. If there is some disagreement about what was discussed, the documentation will initiate additional dialogue and give additional clarification.

You don't want to fall into the trap of verbalizing anything of importance. For example, a verbal statement such as, and I quote, "I think I, or the team, can have this for your department by next Wednesday," then adding, "barring any unforeseen circumstances, of course," which is almost a throw-away. This statement, if communicated verbally, will be carved in stone, and you will be expected to have that task completed by Wednesday. Inevitably, the person or group you made the statement to will not have remembered hearing the last part of your statement, "barring any unforeseen circumstances."

But when you put "unforeseen circumstances" in writing, you allow for a little latitude. I might suggest that you will need that latitude. If you think you can have it by Wednesday, tell them Friday, or maybe even Monday; when you deliver by Wednesday, you will certainly be a hero. If you can't deliver by Wednesday, you've got a couple of days to play with. Time is on your side, and this is going to be your absolute worst enemy.

So don't paint yourselves into a corner. This is just good common practice to get into, especially in an environment where you may be dependent on the mercy or the performance of others who you may not have any control over.

This is a safe and sane technique to use in almost any situation in which the final outcome resides at your doorstep. You don't want to lose face, and worst of all, you do not want to lose credibility, especially at the early stages of this game.

It would probably be a good idea to recruit, invite, or have one or two individuals from each division or department assigned to participate in the project. If you get this kind of cooperation during the early stage, you know that you're now starting to get some buy-in. Then, as delegates from the various divisions become more involved in the planning and development of your site, you're likely to get even more buy-in, and even more cooperation, from those divisions further on down the line.

Now, if it is not obvious, one of the best ways to get this or any project underway is to have everyone who is even remotely connected with the project be at least familiar with the vocabulary of the Web; see that they have at least some basic skills to be able to go on-line. So you may need to do some training here for your team, and later on might consider holding training sessions for everyone in the organization.

These training sessions should also include some relevance for the department who requested to be included in these sessions. For example, how will the Web help your marketing people, your production or manufacturing people, your order fulfillment department? Think of ways that actual examples of functions that are performed by each department could be done more effectively by using the Web during these training sessions.

And I might suggest that you start this early on. There's enough hype around that people are interested; there's probably plenty of people in your organization that have some interest, but don't understand it, or don't know what's going on.

You will start getting company buy-in at all levels at this point in time. You also start getting your departments and divisions reasons to start buying in: "Oh, I didn't know we could do that."

But it also gives you a good opportunity to dispel a lot of myths. The typical example: in a publishing environment, on a project that I just completed here not too long ago, their production department, the people who put these manuscripts together in typeset form to go out to printers, were looking for an easier way to deliver this material to them, because they were spending \$450,000 on FedEx. Now, if there's any reason to build a site, that would probably be one of them. If they could cut that figure in half, that's over a quarter of a million dollars.

Now, when you consider technically the depth and breadth of the kind of files that they were talking about — where a four-color cover is about 80 meg, not counting the illustrative material that's inside and not even counting the text — try goosing that through switching packets on the Web and see if it arrives at the other end intact. Would you want to roll the dice on that as a publisher? I don't think so. So these are some of the myths that you might want to try to dispel at these early stages of this game.

You want to try and dismiss some of the over-inflated expectations that some people perceive are going to take place. "We're going to increase our business 10% by being there." Yeah? Not tomorrow, maybe. So you've got to get a little bit of sense of that urgency lowered, that "we need to be there tomorrow, we need to get this site up tomorrow." That isn't necessarily the right way to go.

The next thing you want to do, of course, is send the team off to surf, surf, and more surf for sites that reflect the features and flavor and texture that will suit your company's needs. There's also a copy of some of the acronyms and terms of Web vocabulary that are sitting up front here, along with data from that survey from *Yahoo*, for those of you that might want to pick up a copy and take it back with you.

Now, this is not some sort of plagiarism that I'm advocating here, and you might not see it in that light initially; but trust me, when your site is completed, it will in fact not be a rubber stamp of someone else's site, but be your very own unique site. Unless, of course, you decide to copy it verbatim, and you certainly don't want to do that.

Now, during this browsing or intelligence-gathering stage, it's extremely important that when interesting sites are located they be shared with everyone on the team.

One good way is to check out what's going on at *Yahoo*. They put up the "Top Ten Sites of the Week." You want to maybe assign that task to somebody, to look at least those ten sites and come back and report on it. But this sharing of information from the team — and I don't know how many people you may have at your disposal, or who will be involved in your team — but this sharing ought to go on at least once or twice an a week.

However, the number of interesting new sites that are going up on a daily basis may throw this phase into something that's unrealistic. Some of you might have several weeks at your disposal, and some of you may have longer; and if you let it, it could be a search for the Holy Grail, and take forever. So you want to put a timeline on this — or better yet, call it a deadline, because nothing has any importance in any business until it has a deadline.

And remember, the site you are building is going to be dynamic. It will change. In some companies, changes might take place quite frequently, and by that I mean maybe even monthly; with others, maybe once or twice a year at best. It really depends on the nature of your company's situation.

Now, during this stage you'll really have to be the glue that binds everyone together, to come to some sort of agreement on how your site will look and feel.

And by all means, keep it quiet until you're ready to present it to the powers-that-be. You don't want, at this stage, to have a lot of misinformation flying around the office for somebody to shoot down before you're really ready to fully explain and present your overall plan. I know this might be difficult, but the secret is no good unless you can tell somebody. So keep your team quiet, no matter how eager they are to share their excitement with others in the office.

Draw up some thumbnail sketches during the next phase, diagrams if necessary; and by all means don't try to create a finished product at this point.

First you want to bring all the divisions and departments back for a buy-in session of concepts that you believe will work for your company as a whole — not just address some of the divisions' needs, but the whole company. This phase may take some more selling, so your presentation should be as good as, if not better than, an ad agency pitching a new client; or I really should say, an ad agency pitching an old client on a new concept.

Keep in mind that we are selling concept here, and not necessarily a finished product. You do not, and I repeat, not, want to get into microscopic details at this stage.

Present your concept in generalities. Leave room for comments or suggestions. Some will be for the better; some maybe not so hot; but at least you've opened up some dialogue.

Even a bad comment or a suggestion may provoke some good ideas, so don't be so ready to turn off the bad ideas. Listen to them. They may give you directions on what you don't want to do. But more than likely, if you are a good listener and your team are good listeners, it will provoke some good ideas.

One thing that you want to keep in mind during these sessions is not to have any egos bruised at this point in time with criticism of those, quote, "bad suggestions."

Your goal is to build agreement and allies among the division leaders and others who may be involved, because you want to get approval from the top. As you heard from the last session, we put the CEO up there and everybody listened. It's also going to be a lot easier to sell downstream to other departments whose resources you may need to enlist to make this project more successful.

If there are disagreements, and there will be disagreements, let the division heads fight it out if necessary. You want to keep a conciliatory position; you want to keep it cool. It's okay to disagree, but do facilitate disagreeing agreeably.

What you're looking for at this point is a consensus of some sort of agreement, and you want to go away from this meeting with that in mind, even if it's only in principle.

Then what? Get the team together, now, at this point in time. Make sure that they're all on the same page, that the team are all wearing the same uniforms, and by all means know what the game plan is.

Now, if you've done your homework, you will probably have this ready to hand out the minute that meeting is over, with maybe some few minor changes.

At this point, by all means one thing you want to keep in mind, and this may be very difficult, is that you're going to need to have a lot of patience. Mistakes are going to happen. Expect them. Use it as a learning tool and as a growing experience, not only for the individual who made the mistake but for the whole team. You certainly don't want to pour salt in the wound. The person who makes a mistake, the last thing they want to do is to be reminded over and over again that it was a mistake. But if you can turn that around into an advantage, an advantage that really works well for everybody, then the person who made that mistake becomes a hero.

You don't want to dam up any enthusiasm at this point in time. You don't want people walking away bitching, saying, "Oh, that was my friend who just got criticized. I think I'm going to bow out of this project." You don't want any of that nonsense taking place; you don't need it. It's tough enough to get two people to agree on one single thing, let alone an entire team.

The important thing is that you want to keep everybody on the team in focus. Since we're talking about team, I think I'll use the "Vince Lombardi" theory of management. For those of you who don't know who Vince Lombardi was, he was a coach of the Green Bay Packers back in the late fifties and early sixties who won several championships for the Green Bay Packers, and went on to be a historical figure.

His theory was, "preparation, planning, and execution," and in that order. More often than not, we're all running off executing without preparing and planning. Keep the end in sight at all times. Keep the dynamics of the Web team focused with the end result very much in the big picture at all times.

Now you're ready to begin Phase I of your Web site. Keep in mind that you're not going to build a static site here, so other questions start rearing their ugly heads at this point. What happens after the site is up? First question: "Okay, we have a Home Page. Now what?"

The creature that you're constructing, or have just constructed, is going to need care and feeding, and lots of tender loving care. Who is going to be the "Webmaster?" What is going to be the nature of your content? Where is your content coming from? Who is going to contribute what, and when are they going to do it?

If you're depending on information that already resides in some database — for example, if you're putting catalogs up — the people that are in charge of this database need to be brought into this somewhere along the line. You're going to have to take that information and convert it to documents that are going to be able to be put up on the Web.

What about graphics, illustrative material? These are important issues that will need to be addressed. In talking about graphics, since I've raised that myself, don't make the mistake of drawing from two or three different sources for your graphics. Don't make the mistake of leaning too much on people who are print-oriented rather than video-oriented. If they have some savvy about the Web, use them by all means; if they do not, I would encourage you to make everything go outside. Look for a video company that does titles and credits which would probably be more appropriately placed on a video screen.

And here's where you want to consider putting a service-level agreement in place.

We've already mentioned the fact that you're going to have to depend on your database people. They're going to need to have some information that they can deal with in terms of timelines. If I've put a request in today, how long will it take me to get this back? Once I get it back, how much time is it going to take to mark it up? How much time is it going to take to include? How much testing do I need to do?

All of this needs to be documented somehow, in terms of a reasonable timeline that everyone can live with.

And also, in developing this kind of agreement — this kind of service-level agreement, if you will — it holds everybody in the chain responsible and accountable for their own, so you're also getting buy-in now, deeper and deeper and deeper. The more buy-in you get, the better off you are.

Particularly, I'm going to give you an example of what you might want to cover in this type of service-level agreement.

First of all, you want to call it something that everybody can identify with. From my example, I call it "shared venture — product information, on-line services systems and technology." These are the three divisions that I feel are going to be most involved. So we're calling it a shared venture.

Now, for product information, for example, what do we want from them? We want them to supply us catalog information. We want them to develop a program to pull that information, as needed, for the Web site. They will supply the graphics; by that I mean if there is illustrative material over and above. For example, if you are in the publishing industry and you want to show off the book cover, it would be incumbent upon them to pull that book cover together, have it scanned, whatever is necessary. So we're spelling out some real tasks here for that particular department.

They will test them on their side of the system. They will also set up a system to add automated links to supplementary materials such as transparencies, software, and other items that an object-oriented database might encompass.

So we've outlined these five elements that are going to have to come from that department.

Now, the on-line services department are the people who are going to be handling this project overall, and they're going to have some responsibilities also. They're going to need to test those links before they go anywhere, make sure all the GIFs come through, and add any corrections not related to the catalog, because the catalog may have gone out with 50 typos in it. You certainly don't want those typos to show up on your Web site. Fix them.

They'll set up a TAR file, if necessary, to send over to the systems people, who will then put it up on the Web.

But before that, they'll test it on both Mac and DOS platforms; I want to make sure this animal is going to work on both platforms. Even though there's a smaller percentage of Mac users, you don't want to overlook or offend this audience either.

They then should go over any corrections related to the printed catalog. Now, that should be incumbent upon that department, if they've caught these typos, to get it back and get it corrected before another catalog is printed.

They're going to keep a log of supplementary materials that need to be added; they're going to organize for these materials to be uploaded through an FTP site. And they're going to process Web mail; this is one really big issue, and I'm going to take a couple of extra minutes here.

When you get down to the level of e-mail, most people say, "Gee, isn't it wonderful? We get 60, 70 pieces of mail a day!" I've got a Webmaster here who doesn't know what to do with this Web mail that's coming in. Some of it may be relating to orders; some of it may be related to technical information about products and services; some of it may be even more in-depth than that.

So during this buy-in process, you're going to need for somebody to buy into this end of the game. You're going to need somebody from each of these various divisions who have the expertise and the level of experience to be able to answer some of this mail that your Webmaster probably cannot. This is also going to take some resources, so you better plan for it right in the very beginning.

Knowing e-mail — as I'm sure most of you do — when someone sends an e-mail, they expect a response in four to 24 hours. That's reasonable to expect. You may want to boilerplate some responses, if they are going to take a long period of time; by that I mean have a couple of prepared letters to go back out immediately, if you know this is going to take days or even weeks to get an answer. [For example,] "Thank you for your inquiry. We appreciate your interest. Please be advised that I am passing this information on to our technical department or our manufacturing department or whoever that happens to be; they will be back to you as directly as possible." This you can send off while you're there reading the mail. Button, the mail goes off.

You're also going to bring your systems people in, to be able to route this mail, so that you don't have to run it out in hard copy and walk around the building passing mail; so you're now looking at hardware issues as well. You look at your internal-connectivity issues as well. You're also looking at the buy-in process.

By now, everybody in the organization is now involved in the Web, at every level. So, even when you get down to that e-mail process, you certainly want to have been prepared for it before the stuff hits the fan and you say, "My God, I can't handle this," and you've got some poor person, male or female, pulling their hair out on a daily basis just trying to respond to 60 or 70 pieces of mail. And it is not unlikely that, if your company has any size and stature, this number could even grow larger.

And that's really what you want! This is the kind of interactivity that you want to get from the people who visit that site; because the better informed they can be, the quicker they start interacting with you, the sooner they will become a customer, or a better customer. And even if they don't, they'll go away talking about you, and that you cannot buy in advertising, PR, or anything else, when people are saying good things about you and your company.

Now, our staffing.... There are staffing problems, obviously. Some of this, you're going to have to make your own decisions on outsourcing. Students, as you heard from Jim a little earlier, are probably a good resource. They're excited; they're willing to work long hours, especially if you get a couple of good grad students who really need the money — and I've never in my life met a grad student that didn't need money — who are excited about the projects that they're working on, who will be able to contribute some real, good, solid advice sometimes, especially if you don't have any real good resident experts. Get somebody out of the best lab out of the best university that you can buy locally. Good source.

Now, what about mistakes? You're going to have all kinds of stuff happening up here. You're going to get those 404 messages. "What do you mean? It worked when we tested it." "All of a sudden it just disappeared."

One very important issue that you need to address again, right from the very beginning, and I'm going to close with this, is that of security. Who has access to the data that can be manipulated? What you don't want to happen is have people in your own company that are out there experimenting with their — "Well, this is my division, I'm allowed to do this." Beware, my friends; they are not! Be very selective as to who has total access to all of that data. What you don't want to happen is to turn your site on in the morning and find out that it's not there. Very, very frightening.

And I might make one other suggestion to you, in terms of when you're changing data on your Web site. You may want to download the entire site, add your data, test the whole damn thing all over again, and then upload the whole thing. In other words, flush the old system down the proverbial —, and start brand new. What you don't want to happen is mistakes going back up over and over and over again. If you flushed it, you know it's gone; however, you may find some new ones.

Thank you, ladies and gentlemen. I appreciate your time. I hope I've humbly been able to share some poignant experiences with you, and I hope this information is of help to you.

If you have enjoyed any part of this, my name is Ken Lang. If you haven't, it's Alan Meckler.

WORLDWIDE WEB LOW-BANDWIDTH DESIGN: HIGH-TECH, LOW CLASS



MODERATOR

Ken Lane

WWW and On-line Information Consultant

SPEAKER

Jaime Levy

Creative Director, *Word Magazine*, Icon

Ken Lane: Welcome to the final portion of this afternoon's conference session. Before I introduce our next presenter, for those of you who don't have good light and don't write fast, there will be copies of an audio tape of this and all the other sessions as well as a CD-ROM for the entire conference available. These will be for sale at the booths near registration. So if you want to get a copy of this or any other tape, [it will be available]. And I have been promised the airplanes will be eliminated from the tape, so there will be some blips. Like President Nixon's seventeen minutes, they will disappear. And I understand the editors do that quite well.

The format for this session will be that the presenter will speak for about 45 minutes, and we will allow for about 15 minutes of Q&A, so hold your questions until the end. You might want to take some notes and remind yourself what you might want to ask.

It gives me a great deal of pleasure to present our next speaker. Her name is Jaime Levy, and she is the creative director of *Word Magazine*, a commercial electronic publication distributed via the Web. Her responsibilities are to design *Word* using HTML and to push the envelope of the Web with regard to integrating multimedia interface design and user feedback. She also does Web design for Icon clients, many of whom are from New York City's publishing and music industry. Prior to her role at IconNet Jaime published a disk-based electronic magazine called *Electronic Hollywood*, as well as the interactive disk-based press kit that went out with Billy Idol's album *Cyberpunk*. She teaches a class in electronic publishing at NYU's interactive telecommunications program and was recently recognized by *Newsweek* in their February 27th edition as one of the top fifty people to watch in interactive media. Ladies and gentleman, Jaime Levy.

Jaime Levy: Thanks for coming out to this tent and thanks to Meckler for having me here. It's really nice. What this presentation is supposed to be about is low-bandwidth design, but I'm going to expand it to something more futuristic and exciting — to multimedia integrative design. That way I can sneak in some more of my later work, which I don't necessarily call low-bandwidth anymore.

I should probably start off with defining what low-bandwidth design is. What it meant to me five years ago when I started electronic publishing was trying to jam as much information as I can onto a floppy disk. This was before there were these CD-ROM things. I wanted to make an electronic magazine, and I was going graduate school at NYU. I decided for my master thesis I was going to do an electronic magazine on floppy disk in this *Hypercard* language. It was called [inaudible].

It was really kind of tough to figure out how to make the graphics so they would be small and make the sounds so they would be small, and then make the text and everything integrated together so I could put it on a disk and mail it out to people and sell them. So that was how I got my start. And the whole point of it back then was to be able to distribute my animations, because everyone has a floppy disk in their computer. They even do now, so my

disks aren't out of date yet. But one day they probably will be, as soon as we stop having these floppy disk drives.

That was a big issue. I wanted to make something and distribute it myself. I didn't want to — my background was in film and I originally wanted to direct movies. I could make my video art or my movies, but to get them out to where people could see them is a really big deal, as we know. But it wasn't such a big deal to distribute my disks — though at first, actually it was. I'll tell you what happened, but before I get into that I'm going to back into this low-bandwidth design thing.

I was doing these disk magazines. So you have this information and it's small and you want to get it out to people. We have two things now; we have these *Director* disk-based animations that I've made the last few years, and now we have this Internet thing. And what do they have in common? Well, what they have common is the Internet is still — pretty much most users are coming to it from a 14.4 or 28.8 modem, and they are still clicking and waiting, which really sucks. Remember the old CD-ROM, the single-speed drives, how you'd click and it would load up another animation? They were pretty bad. Most CD-ROMs are still pretty bad to me, but the point is that with the Internet I don't think it's too exciting for people to click and wait. I'm still seeing a lot of cross-over now with doing these disk-based animations because you can now distribute them over the Internet.

Okay, you're saying, how? I don't know if you're familiar with *Director*, but it's one of our great authoring languages for making animation. It's going to premier in a few months with a *Netscape* where you can click and download a *Director* animation. So I'm going to be happening again, because I'll be able to use my disk space animations from before and distribute them over the Internet because they're small. That's really good news because most people don't know how to do that. I can prove it to you because there aren't that many other disk-based electronic presentations out there.

When I did the first IPK — they didn't even call it IPK back then — it was Billy Idol's. They wanted to do this direct. He went into a bookstore and bought one of my electronic magazines on disk and went, "Oh, I want to have one of these with my new album *Cyberpunk*," because he got into this "cyberpunk" thing. So his people called my people and said, "Would you do a disk-based animation for us? We're going to try and distribute it out with the record." And this was very exciting because no one had ever done this before.

And here I was, making my little disk-based animations, driving them to bookstores and selling them for \$5. And now, all of a sudden, someone was going to package them with a CD and put them into record stores. And people were going to pay \$20, or whatever they were selling them for. They sold 18,000 of them, which was a really big deal. So it was fine and something I made became commercial and they were selling it, so it was like "hooray for low-bandwidth design."

But then what happened was that no one followed up on it. There are a few other bands that did IPKs, but they didn't become common. What did become common is musical promotion over the Internet, so it's kind of interesting because there's been a lot of change and I never knew what was going to happen.

Way back when, in the early '90s, four or five years ago, a friend of mine who was on the original Apple team — I was exhibiting my electronic magazines at a trade show and they felt sorry for me because I was a girl and I was an artist and I was making these animations. They said, "We'll let you have a booth, you can set up your Mac II and you can exhibit your electronic magazines."

Anyway this guy from Apple came by and said, "Wow, this is great, you're thinking ahead. You're thinking about low-bandwidth design." He used those words: "You're thinking about trying to get as much information into as small amount of space as possible. That's going

to be really important. There's going to be this thing, this big network coming down, and one day people are going to buy your electronic magazine, cha-chink, cha-chink, and they're going to put their credit card and the money's going to go right into my savings account and it's going to be great." I totally didn't believe that. I hated the modem and the Internet or whatever it was back then. The idea of sending text wasn't very exciting. I didn't imagine the WorldWide Web back then. But now it's here and *Director* is happening with it, and it's getting really, really exciting. So anyway I think I've talked enough — I'm ready to show stuff now. So I'm going to show some stuff.

I guess I'll start with *Word*, because here it is. *Word* is this electronic magazine that we started, and it came out on the Web on June 26th. It's an interesting experience at Icon because it was just — when they decided to do electronic publications and Web design, it was just me. And then we hired two more people and we have a lot of clients now. It's huge, the amount of stuff we're producing, but the office hasn't gotten any bigger. It's just the three of us.

And where are all these designers? Well, the cool thing about it is they're not in our office. They are away from us. They are out in Internet-land, and I don't have to see them or talk to them on the phone, but they're still designing for *Word*. So a lot of stuff you're going to see I have overseen as an Art Director, as Creative Director, but I was able to art direct over the Internet. So what's very interesting is this was — we're not only seeing a product that's distributed over the Internet, the way it was created, the communication, was done over the Internet.

I'm going to show a few pieces, and if they happen to be low-bandwidth design, I'll point them out especially. Here's one that just went up. I should tell you something about the *Word* interface or what it is; *Word* is a short story literary magazine. It's interesting to me because, well, first of all, I was publishing electronic magazines and short stories before, so this is where I wanted to go. It wouldn't be so exciting to dress up a story about the latest Pentium chip. There would be no reason to make it look very cool or to have much exciting navigation or perhaps a BBS behind it. But with short stories you can do that, because they are creative to begin with. That's another cool thing about *Word*.

So we have a combination of short stories and these integrative multimedia apps that we're putting together. The staff just isn't that big but, as I said, there are a lot people working on it. But they are all over the country, or all over the world actually.

I'll tell you a couple of secrets. *Word* is different. That's one thing you can't have with CD-ROMs. You put the CD-ROM into your computer and you play it, and then you shut it off and then go pick up your kids at school, and then you come back and you play it again. Guess what? It's probably going to be the same exact first screen. Maybe it will have a non-linear subtext or something, but with most CD-ROMs — you have your gaming experience, but they are built as they are, and they call them interactive and they called them dynamic but it's not connected anywhere else. It is what it is, and that's what it is. It doesn't thrill me that much, to tell you the truth. But *Word* is so thrilling because it changes a lot.

You see that banner? I don't know if you can read it, but it says, "Issues Culture Plenum." Every ten minutes that banner changes and the color of that banner changes, which is really nice. So every time you come to work the banner is different. There's something different about the page. What else is different? The icon bar going down the side: "Table of Contents — Money, Travel, Machine."

Now, we have sponsors in *Word*. That's how they pay our salaries supposedly, so we have to give them certain amounts of stuff so they give us money. So part of the way that works is we give them flashscreen ads that you'll see, and they get their little banners at the top. But there are some complaints, because the guy who sponsored "Money," let's say, was getting more hits than the guy who sponsored, let's say, "Gigi" at the very bottom, because

people generally click what's at the top of the screen when they're cruising around. So what we had to do was come up with this rotating icon bar, and every ten minutes the icon bar — so "Travel" will go up one and "Money" will go down to the bottom. It will keep going like this. Pretty neat, huh?

What else changes about this first screen? The stories. By law we are supposed to put up new content every week in *Word*, so we are trying to put up an average of three stories a week, which is okay, but it will probably be more soon. But that's the minimum. That's just stories. We're always building other stuff into it. But that means the front screen, every time you come there, whatever is new, you see it right away so you don't have to go plodding through looking for whatever is a new thing.

Let's check something out. Here, I'll show you, I'll prove to you that it's true. I'm going to reload the screen, okay? Now remember, "Money" is at the top and then the purple banner — that's going to go to *Word*, you say?

Okay, so let's talk, talking painting. There's your ad, a "Meta-ad" for Netscape — a great product, right? This piece I'm particularly proud of because I really feel that I used the medium. I don't always do that, but this time I did. It's a painting that talks, hence the title.

I like this guy named Jonas Hall. He's from [inaudible] and all their band and he does spoken word. He's on MTV a lot and he's very funny. Then my friend, Michael, he's a Soho artist. They would normally never work together or know each other at all. Jonas Hall spoke thirty poems for us and he gave them to me on real audio — not real audio for me. He gave them to me on a cassette and then I made them into real audio samples. Real audio is a great data-streaming technology that we're using right now to play audio in real-time on *Word*. You'll hear it, hopefully.

Anyway, so what I basically did was make it combine a painter and a spoken-word person and a programmer, our genius programmer at Icon to help us make this app, where when they click on the banner up here it repaints the painting. Isn't that great? Good.

Hold on, maybe, there he goes. We should get three new images. And you click on the art and hear the spoken word that goes with that image. Here, let's try to find one that's cool. I'll click on that one, an audio piece.

Presentation

M: What am I saying and why and what are my motives? Number two, if I knew it all along why didn't I stop before I started? Number three, why have I not gone to a [inaudible] since 1989? Number four, hey, what was that? Number four. Number five, if I'm so sure that the worst of it's over, why is my apartment booby-trapped, why do I have six mailing addresses, how come I never answer the phone?

Jaime Levy: So basically it's a different way to access poetry or to even experience it. The cool thing about real audio is that you don't even have to be on the page to hear it, you can even put it out on *Netscape* and it will keep streaming. So if you're really into these spoken word...

Anyway, I'll play one more just a bit. I think you've got the basic idea of this application. They're really funny, you should come check it out.

Presentation

M: It would shrink, of course...

Jaime Levy: So let that go. I'm going to click back. Now I'm copying it to the machine section, and I'm going to show a couple of different pieces where I integrate multimedia. "Cybergothic" is a basic photo essay. This I would consider a little bandwidth. Each image is 40K. They're

grayscale JPEGs, but you don't have to — if it's not downloading thirteen images when you come to this it downloads just the bottom bit, the "Cybergothic" by Scott, and the two icons below it and then with the CGI it's throwing or pushing these images to us. So basically you're not wondering if this is done yet, because it's not a matter of downloading. It's almost like the real audio in the sense that it's coming at you and you can quit out whenever you want. It's not like you haven't completely built that page. So that's what that's like. Let's see; I could turn off this now.

Okay, I'm going to hop over to another place and show you a couple other pieces. How about just a regular story? We'll sort of scan through it. Generally, for stories in *Word*, I ask the designers to break the story so there's never more than a paragraph per page, but because this story was designed with HTML I can make an exception, and also because she designed it vertically.

These are two things to be concerned with in low-bandwidth design. One is that if you design something horizontally, the way that *Netscape* loads images and everything on the page, it will end like this. So if you've got something that's super-wide, it's going to take a long time to load. But if we have it like this, by the time that they're ready to scroll down it will be there.

When I talk about HTML text I'm talking about this stuff right here. This stuff doesn't take up any time to download. You want to use this stuff. You also have to make it look good. It's hard to make HTML look good. It actually takes a little bit of tweaking. I should just do it now.

The Web sucks. The Web is so ugly. It's not even that *Word* is so great, it's just that everything else out there is so bad. It's like public access. I just can't believe it. I mean, I'm so happy that everyone's empowered and people can design their own Pages and put them up on the Web, but it just looks [terrible]. I mean, I don't even want to look at it. You know, you go to this stuff and you look at it and it's just, you know, they don't take any care.

Remember desktop publishing? That's how I supported myself when I did graduate school. I didn't know anything about design. I would go in and root for an account; they were looking for a designer, and if I can turn on the Mac they'd hire me. I had to learn design by faking my way though. People are doing that. They call themselves "HTML designers," but they're not designers. They say they know HTML — big deal. You can learn HTML in a day. Design takes a long time.

All right. Now this piece of text here, as you can tell, is a bitmap. So we have bitmap text and HTML text. Now, bitmap text, of course, has to be downloaded, so let's try to make our bitmaps as low-bandwidth as possible — which means as few pixels as possible, which mean it's as few colors as possible.

So how do we make things in fewer colors? There's a couple of ways. You can start with your RGB image in *PhotoShop* and then you go to index color for your GIFs. You have your choice of 8-bit, 7-bit, 6-bit, 5-bit. What I like to do is, in *PhotoShop* — we're getting technical here. I'll tell you my image and I'll go "Command-A," which selects it, and then I'll go "Command-C," which copies it. Then I'll go "Command-N and Command-V," and I'll just paste it. And I'll make that same image, I'll make five of them up on the screen.

And then I'll go up and index it at 8-bit and then 7-bit, and then 6-bit and then 5-bit, and go all the way. And then look at them and say, "What can I get away with here — the lowest number of colors?" That's really key. People keep putting up these images that are 8-bit, saved as 8-bit, and they only have sixteen colors. They should be saved as 4-bit. These are things to concern yourself with.

If you don't understand these things then do it the safe way, which is the way that I just explained, which is slowly going down from 8-bit to 7-bit, and see how low you can go before it starts looking really bad. That's one thing to think about.

Another thing that you can do — I'll just keep cruising though. The way this piece is, this is the hypertext thing, so if we click on the flame you get a picture. Ah, that's nice. This is what I like, you've got your screen, you've got your little piece of text, you can see it all. It's easy to navigate.

One thing, this rule in *Word* is a little absurd — I don't really believe people do it — we make it so they never have to click outside of the *Word* world. They never have to come up and click back, God forbid. That's real important to us. But what that is, that is navigation. That's another thing I concern myself with a lot. So basically I can go "Next," and see how it's loading from top down, so I can read, read, read, but actually if we jam down here, it might still be loaded pretty fast, because we're in ISDN — yippee!

Okay. Let's keep cruising though. I'll show you another piece. Let's see, how about this. This is "[Ambyer] Realm." I'll give you an example. It's about ambient music. I'm a big fan of that kind of music, so I asked three DJs to give me a 45-minute tape and I made them into real audio, so you can listen to 45 minutes of music and do what you do. That's really, really exciting to me. And you can also find out about the guy who made it by clicking on the guy. You click on the turntable, you hear the music. You click on the guy to hear what it is. Is it playing? You can't hear the sound? It's so ambient you can't even hear it.

I like to leave instructions: you click there and it tells you all the things you need to know. Very exciting. Oh, there we go, so we can hear. And real audio is real exciting to work with, just because I'm so used to *Director*. When I did my disk-based stuff, I had to have these annoying five-second loops. Anyway, we'll get to that in a second.

I've got to tell you something very funny. Roxanna's nails — Roxanna is the secretary at Icon. We have this deal that in exchange for her content we'll have her nails done. So this is an example of that. So you can see her nails and hear her talk about them.

Presentation

W: Hello again and welcome. You are on the WorldWide Web with me, Roxanna of the CNN, The CyberNails Network. All right. You know what it's like, it's like nails, when you were a little kid you went to the store you bought some fingernail polish and you paint your nails that way. Like my typewriter, but today there's technology involved.

Jaime Levy: All right. You've got the basic idea of that. I'll just show you a couple quick things in *Word*. I want to show the electronic magazines. I should probably show you some of the backbone behind *Word*, which is the BBS; that's sort of interesting. After you read the story you can interact, if you register in *Word* with the with the other people. You can basically pick a topic — we have one here — and how many you want to see viewed of those responses and join the discussion and see what they're saying about that story. This is about somebody's trip to Morocco and you can say, "I like it" and submit the message and you post it. It's so easy.

Anyway, there's these BBSs behind most of the stories in *Word*. We're trying to move in that direction and have chats integrated so people can — they aren't just there to read our stuff and be entertained, but also to interact with each other. That's part of the Web or using the medium.

I'll show you one more story. I'm going to show you an example of a story that is not low-bandwidth designed. I can pick on it because I did it, and it was a big mistake. It was what I did at the very beginning because I wanted to do something slick. We don't allow this anymore. Right now when I have designers design stories for *Word*, I give them a 60K image limitation per page. They can have 20 images but they better not add up to more than 60K. This one does because I went for this bitmap text idea over these heavy backgrounds. These images

right here are a little bit too big, and so this story can be a bit slow loading on a 14.4 or 28.8 modem, which is why you should avoid using bitmap text if you can. On this page you'll notice I used the same image in the background as I did on the previous page. That is good because it goes into cache, which is important because it doesn't have to load again. We try to use that a lot in *Word*.

I've got to show you a page I really like. I took this picture in San Francisco of this piece of [stuff] on the ground, and I put it in the background. Isn't that cool? Well it's like this part here, it's about [stuff].

I feel so strange telling these tricks because they're so — I'm so dated I could be crossed out in a year or two. I think and I hope this whole low-bandwidth issue is really going to go away. I really believe that. I'm one of those people that believes that the Internet is going to be on TV really soon, or something like TV, where people are going to be sitting on their couches with the popcorn and their little keyboard and they're going to be browsing. We'll stop calling *Word* a magazine — we'll call it programming. It's going to be like watching TV, but you'll be browsing the Web. It will be fast and we won't have to worry about these things, because most people don't want to worry about it.

A friend of mine who works at Prodigy has designed their big music site. She said to me "Oh God, I'm working with this designer, he's really awful. He's never done the Web stuff, so he keeps designing like a whole page of a magazine. He gives me this big, big GIF image because he doesn't understand how to do low-bandwidth design and break it into little pieces and deal with loading problems. And he doesn't want to deal with it. I'm going to have to get rid of him." And I said, "That's really sad, because he's a really good designer, but he's not open to trying these new things." There's not really a place that you can read about this stuff. It's a lot of experimenting.

One program that I highly recommend to everybody designing Web sites is the *DeBabelizer*. It is a magical program. You can use this program even if you are a total nitwit. All you have to do is open it up and then you go, "Command-O," like with anything else in the world on the Mac, and then you open up your GIF image and all you do is go, "Save." Check this out. One-half to one-third the size of the original — pretty cool. Do that to every image on your Web site except for transparent ones, and it will make them load faster. It's so easy. That's my spiel about the *DeBabelizer*. I want to recommend it.

I'm going to hop out of *Word* for a second and show some — back in the early days when I was doing my electronic magazine stuff, and why this *Director* stuff is coming back into being important again, as I said, is because of *Shock Wave*. And *Shock Wave* is this new technology — *Director* and *Netscape* working together so you can download *Director* movies. How it's going to work is, basically, you know how when you've gone to a page in *Netscape*, if it's 50K it pretty much just downloads and you're there. If you can make a 50K movie then it will download and play instantly. So it's becoming important again to figure out how to do these movies that aren't very large. You can do so much more animation in *Director* than even in the much-hyped *Java*.

I'll prove it to you. I'm going to show you this disk. You bought this at Tower a few years ago if you liked Billy Idol. And here it was, and anyway I'm going to play that disk and why I'm showing the disk is because it's not a CD-ROM. I told you, I hate CD-ROMs because they are so stupid, you make this digital thing and then you put them on this thing and then it's like you put it back on paper again. It's like digital to paper — it just doesn't make any sense to me. If you're going to make something digital, just stay digital, and it's going to package and paper and be sold in book stores. I can't wait until they go away, but anyway, they're fine. It seems to me that with CD-ROMs people are confusing a storage format with a distribution format. But anyway, let's not get into that.

So, this disk here, again it's on the disk — I keep showing the disk because it's like a magic trick. It runs off the floppy disk, which means it's small. That is important, because that means that it can be copied. It's about fifty cents to make these disks. Anyway I'll show, though you got the idea, I'm sure. So, I'm going to click on it — oh boy, here we go. I'm going to point out the low-bandwidth things behind this. Can you hear me? All right.

This is the main interface of this Billy Idol disk. It loaded pretty fast, and that is because I'm using things in *Director* that don't take up any space in terms of art space or kilobytes on the floppy disk. They don't have to be loaded. They're just like calculations or something within *Director*; they're re-drawn and they don't take any time. That's how I understand it. I don't have a programming background, but I know what they are and this is what they are.

Color-cycling is instantaneous and doesn't take up any room. Great effect. Ink effects, all of that, in *Director*. Stretching images. It doesn't take any space to stretch an image. This Billy picture right here is only so big, but I stretched it. Yes, it "pixelates," but when you make it all messed up with the color-cycling, who cares?

Okay. The concepts, long lyrics, digi-art, they're basically on just black little back grounds. Within *Director* you can make this red or white with *QuickDraw* ink effects. I do a lot of animation with that. This thing across the top, that doesn't take any space, it's just this Billy Idol font going smush, smush, smush. I don't have thirty different fonts up there. It's just one piece of artwork, so I'll just cruise through this. If you start breaking it into pieces you realize, with all of these, that the reason it loads fast is because I'm not using that much art. I'm being very resourceful, or trying to be. Like here he is; his eye is the same piece of artwork four times, with different ink effects. We've got the top two, then the bottom two. So you can do these presentations.

This text here I actually loaded with the *Font DA Mover* into the *Director* app. They tell you not to do that, but I don't listen to them anyway. That way you can have the cool font. You can have as much text as you want within *Director*, — it doesn't take up any space, except like 10K. You can color it, you can bold it, you can whatever; you can't adjust your leading, though.

Anyway, you can do stuff like this. All this text did not take any space, so you can imagine that if we even took this part of this presentation out and saved it and made it downloadable from the Web, we can make some interesting-looking stuff. People like to look at things that move around on the screen. It keeps them excited.

I've got this crazy animation and animated text. Listen to the soundtrack. Could you put it up for a second? It's really crazy. I'll explain what it is after you hear it.

Presentation
M: [inaudible]

Jaime Levy: I have five to ten three-second samples, but I just butt them up against each other in *Director* across the score to create more sounds. You can have two tracks in *Director*, so you put one on the top and one on the bottom and all of a sudden you have a different sound. By butting them side by side or below each other, instead of just having ten samples you have many, many more. And that's a good thing to do in these *Director* presentations.

By the way, when these download into *Netscape*, which you will be seeing a lot of in a few months, they will have sync sound, which you cannot have with real audio on the Web. They will have interactivity. All this clicking, everything that you see here, will be working off on the Web, and hopefully it will be inside the browser soon enough. It's just a more dynamic, more exciting presentation. You know, things blink — you can't have things blinking, except for maybe one word of text, like this. That's the basic idea, you click on this and it's so great.

I'll show examples of two animations that I created that are low-bandwidth animations. This whole — to go through everything on here — literally to read everything, it takes about 15 minutes, and this can be stuffed down to about 500K. So there's some usefulness to this, at least right now, in 1995.

This is just using the tiling effects in *Director*. You just make the image into a tile and it — it's really crazy. This one is just using the same images and a paint brush and just swirling it around. It's not beautiful or amazing or anything, but it's low-bandwidth. I think you're getting the basic idea now.

Let's show another thing I did, which was this. You can't buy these any more except at St. Marks Books in New York, but I had five book distributors for them. I had a thousand made and there's only two hundred left; I'm keeping them for the future. Anyway, inside is a floppy disk and it's a whole book. It takes two hours to read and it's on a disk. But it's compressed on a disk, as opposed to playing off the disk. I'm still excited that I was able to do that, because it was total hell. I'm going to show what that is.

What I did was I got the rights from Jaime Hernandez, who has done *Love It or Rock It* comic books for five years. I was able to re-scan everything and put it into a news story. It's a 100-page manuscript about this drug dealer who escapes from rehab and they get chopped up. I got Mike Watt to do the music. I got a horror story writer and Jaime Hernandez and a woman from *Voyager* to help me edit it. We put together this electronic book on disk.

What preceded this were just the expanded books from *Voyager* that were not real exciting — they were just text on a disk. What you have here is animation, music, a little interactivity. My rules are I try to keep things very simple, using basic interfaces. This is black and white because, guess what, 1-bit artwork doesn't take up hardly any space. I have a bookmark programmed in here so if you only make it halfway through and you want to quit out, it saves the space, so the next time you come back it takes you right there by clicking on the bookmark. How ingenious.

Okay. I'm just going to cruise through — you get the basic idea. All this text here is just ASCII text. I loaded the font into *Director*, so that way you can look at it and it looks great, but it's not like they can steal the font. They don't have the printer font, they just have the screen font and they only have it at two sizes; that way you can have this much text and it takes up no space. That's how I did this novel: using ASCII text, but loading it in.

I didn't want my interface cluttered up, so basically you see one piece of artwork and a paragraph of text per screen, with animation. Basically, it's an electronic book. It was a lot of fun. It took a year of my life and it sells for \$15. The real exciting thing to me is, as I said before, that I was able to stuff all this information on a floppy disk.

I think I pretty much went over what I wanted to say. So I guess we could open it up to questions. I'll demo some more stuff if you want. Should I do that?

M: Tell us some more about [inaudible].

Jaime Levy: The platform I design for?

M: What's the minimum [inaudible]?

Jaime Levy: I design for 256 colors, 8-bit for the Mac and for the PC. We check everything that we do. We do it on the Mac and then we check it on the PC to make sure it looks good. There's a lot of issues with that.

When you're designing for the Mac you have a lot more screen real estate than you do for the PC, so we have to cut that down. I give the designers a 500-pixel width maximum for

pictures in terms of interface imagery so it doesn't fall off the screen, you just have to scroll to the side. There's not too many different things, except that the dithering on the PC — a lot of people have 16 colors and the backgrounds can look really bad, so you have to have everything looked at under 16 colors. They'll tell you they can't read that text over that background. That happens a lot to us.

W: [inaudible]

Jaime Levy: I'm sorry, say that again.

W: [inaudible]

Jaime Levy: To load the font into *Director*? How to do that? This *Font DA Mover* program — they don't tell you this, but with *Font DA Mover* you go "Open" on the left side, and it opens up all the fonts in your system folder. On the right side you hit the option key down on the keyboard and then you hit "Open." And you can open up your *Director* movies so you can stuff resources in there. What you do is you stuff text, you stuff the font. That way you can have ton of text in *Director* and have it take up virtually no room.

M: What are your, what do you mean setting [inaudible]?

Jaime Levy: For designing on the Web?

M: Yeah.

Jaime Levy: Everyday when I turn on my computer the most important program that comes up is *Eudora*, believe it or not. It's a great e-mail program because it's so easy to send and receive detached files. I'm art directing a lot over the Internet, where people send me their work and I look at it and say, "That looks [terrible]. Do this," and e-mail it back. There's *Eudora*, there's *PhotoShop*, of course with *KPT* — *Kai's Power Tools* are good for doing some things. *BB Edit* is an HTML editing program I use. I could use any of them, but I like *BB Edit* because it was the first one I used. What else? *BB Edit* and *DeBabelizer*, as I mentioned before.

M: [inaudible]

Jaime Levy: What?

M: How do you spell that?

Jaime Levy: *DeBabelizer*? D-E-B-A-B-E-L-I-Z-E-R. It's a great program. You can do batch files in it. It's really cool. You've got your artwork, you've got all your PICT files — like here, check this out. I'll tell you a secret. Check this out. Where's my place? Well, let's go here. You can do fake animation over the Web. I did that here.

This is not a low-bandwidth presentation, this is a high-bandwidth presentation. I'll show you something funny — no I won't — oh, stop it. (Come on. All right, there it is.)

How I used a "bab" in this program: this is a 360 degree walk-through of space with animated video projecting, so you click — here, we'll put the soundtrack on. It's annoying. It's me and my friends sitting in a cafe talking about stuff, slacker stuff. So you go in the door and you're in this room and you can rotate around this place's four walls. On each of the four walls

is projected video, which were just digitized video basically; this is *QuickTime*. There they are, smack in the middle. There is coffee imagery. You can click on the bloody O.J. glove and the wall rotates to the right, so you have whole new projection.

How did I do this cool animated video? *DeBabelizer* played a big part in it. What I did was I grabbed the video and then — in *Premier* you say “animate,” you edit the video so you have the part you want and you animated the PICTs. Let’s say you want ten seconds, but only two frames per second, so you figure that part out. It animates the PICTs, so then you have these PICT files...

[Tape change]

W: [inaudible]

Jaime Levy: Do I use CGI scripts to rotate the images?

W: [inaudible]

Jaime Levy: You mean on the first page? Yeah, those are CGI scripts for the icon bar and for the banner at the top.

W: [inaudible]

Jaime Levy: I’m sorry, I can’t hear you.

W: [inaudible]

Jaime Levy: Who wrote the scripts?

W: Yeah.

Jaime Levy: Our programmers. And they are for sale.

M: [inaudible]

Jaime Levy: A CGI script?

M: [inaudible]

Jaime Levy: Yes, and the thing about these scripts is that you have the programmers write them so you can reuse them over and over again. Basically, as I said, can you write me this script and I just dump 100 pictures — I’ll use the same names — but if I dump another 100 pictures in there, it will just take those and use them, even if I only put in 64 one week and 83 another week. And they can write scripts like that so you can have pieces like this where you can keep using them over. The animations in *Word* change a lot for just using the same scripts. And they are just basic C code. So it’s really useful to get a higher C programmer to work with that speaks English, because you can do a lot more.

M: [inaudible]

Jaime Levy: I'm sorry?

M: [inaudible] DPI?

Jaime Levy: What's DPI?

M: [inaudible]

Jaime Levy: DPI? Dots per inch? Always 72. Always. In *PhotoShop* when you get these high resolution pictures, the first thing you do when you get them from — you're working with these agencies that always give us these Quark files and they want to take this brochure and make it into a Web site, and they've got these like 300-DPI images; you make them 72 immediately.

W: [inaudible]

Jaime Levy: You can't use it for what?

W: [inaudible]

Jaime Levy: Yeah, if you re-save a transparent image in *DeBabelizer* it won't be transparent anymore, but it will be smaller.

W: [inaudible]

Jaime Levy: Yeah, yeah. You can then open it up in transparent and it will make it bigger and transparent. It's really cool. I love that. Don't you just love the Web? It's so wonderful. Is that it? Oh, yeah, go ahead.

M: [inaudible]

Jaime Levy: The what?

M: [inaudible]

Jaime Levy: *Director*?

M: [inaudible]

Jaime Levy: Oh, you mean the program?

M: *Word*.

Jaime Levy: *Word*? What do you mean? You're looking at *Word*. It's right here. I mean, you know, it is what it is. You don't even need me to show it to you, because it's for free. You can just go to www.word.com, when you are in the cafe with the Web access or at your home, and you can see it for yourself. It's so wonderful.

Oh, we're getting nice broken images here. Don't ask me why. I mean I could just cruise through here, but I'm going to stay away from this story because it's being naughty. Are there

any other questions? Did you see that, how it delays? That's a good one. Here's a new story, this one's actually fairly fast-loading. Oh, getting lots of chops. Help.

Are there any other questions?

M: [inaudible]

Jaime Levy: When I say design vertically — what if I show you an example of something that's designed horizontally, that takes forever to load, and then you'll get it. We'll work backwards. When stories have been in *Word* for two months and they're old and they die, what we do is we put them in "Dead Word," which is in the *Word* Info Section. There it is, *Dead Word*. And that's where I put my horizontally-designed stories. Here's a good one. As we see, there it goes, so check this out. It's so slow. Awful. Isn't that awful? It's because it's horizontal and it's trying to draw.

But what's nice about this story, though, is that I hired a video artist for \$100 to just go shoot pictures of people smoking. We just grabbed them and they came out looking really nice. Bad design idea, but the pictures came out looking pretty good.

Any questions? I can't see anything.

M: [inaudible]

Jaime Levy: Re-map text?

M: [inaudible]

Jaime Levy: This is bitmap text. That's why it looks like — that's why it's so slow, because it's bitmap and it's horizontal. We've done horizontal design with HTML text; it's a little bit faster, but it's still that same issue the way it loads, so we are looking at only just this part of the screen, but it still has to load everything to the right of it. So you have to be careful of that.

I guess that's it.

INTERNET TECHNICAL WARPING THE INTERNET WITH OS/2 WARP



SPEAKER

David Moskowitz

Co-author, *OS/2 Warp Unleashed*, Productivity Solutions, Inc.

David Moskowitz: [Hello, I'm David] Moskowitz. I have a hand in a small book that we're going to give away at the end of this session, called *OS/2 Warp Unleashed*. Also, depending on how many other people come in, we may end up dealing with another copy of this as well. But in order to do that, everybody should have two forms, one a yellow and the other a white form. That white form is an evaluation form, and we're going to draw the winner from that white form. That does not replace the speaker evaluation that Mecklermedia may also ask you to do as well. This is for us.

M: [inaudible]

David Moskowitz: You don't have any of those forms. Is there anybody else who doesn't have one of the forms? I think we can fix you up. One of each, a yellow and a white. We used to do this with both sheets the same color. Those of you that are speakers, who ever do this type of stuff, if you make each page a different color then you don't have to tell people that they're supposed to have three pages. There's something about growing up in the post-Sesame Street generation — we've forgotten how to count sometimes. So if you say you should have a white one and a yellow one and a green one and blue one, as long as people aren't blue-green color blind, you don't have too much of a problem. Of course if somebody is color blind, then this doesn't look the way it should either.

Part of what we're going to be doing today, in the hour that we have, is look at why OS/2 makes sense to deal with Internet communications. We'll look specifically at OS/2 and the Internet and then we'll get into some of the technical stuff about what it takes to make OS/2 work. Finally, we'll do a brief demo. These systems are not connected to the Internet so the demos will be local, and we'll show you what's available.

But the real reason that I'm here, more than going through the particular presentation material, is to try and answer your questions. So to that end, if you have a question, please ask it. I can't begin to guess at what you don't know. Because of the difference in lighting and whatever, if I'm in the well of lights that's there, it may be difficult to see you, so please don't hesitate to say something or make yourself more obvious than just a handshake. That's rule number one — if you have a question, I'll answer it, even if it's, "I don't know."

Rule number two, however is that if I ask questions, dead silence doesn't cut it. Okay? Hello, that was a test. That will work, as long as it's not dead silence. Anybody here that English is not your native language? One person — you have an excuse. Everybody else, no.

Did anybody, when you were growing up, have a teacher that was out of the days with the one- room school house? I did, a Miss Crumb, appropriately named when you stop and think about it. For seventh grade she taught us that when the voice goes up, it means it's a question. I'm working hard, I know.

Can we try this again, is everybody here, alive and well on Monday morning? Okay that's better. I understand it's rough.

The question is, why use OS/2 specifically when Windows 95, Windows NT and DOS have been around for a while? I won't argue for or against UNIX. I use UNIX. In fact, I run the UNIX forum on CompuServe, so that's an environment that I'm very comfortable with.

But if we're talking about Intel platform, mass desktop appeal, then the real issues are OS/2, Windows in one of its variants or DOS. I don't think anybody would argue that DOS is not exactly the best vehicle for graphic communications, or that one of the variants of Windows does a much better job.

What we get out of using OS/2 is something that you really don't begin to get in the Windows arena until you start considering Windows NT, and that takes significantly more resources to make it work. In fact, when we do the OS/2 demo on that thing, it's only running eight meg of memory and it's got a small hard disk and a 50MHz processor. So we're not talking about a speed demon by today's standards.

What I have done on my desktop system, which is a 486 DX2 66 with 16 meg of memory that is run concurrently, now I've got BIOS that supports multiple, more than two, COM ports simultaneously. That's a computer BIOS issue, it's not specifically a DOS, Windows or OS/2 issue. As long as the hardware provides for separate interrupts and separate I/O addresses, OS/2 will very nicely allow me to deal with connecting with the Internet and a 14.4 fax coming in at the same time that I've got another connection going to CompuServe, all without impacting other stuff that's going on in the system.

M: [inaudible]

David Moskowitz: Four, there are a total of four modems on this system, but this is all done with three separate modems. Dialing Advantage for the Internet, as an Internet provider, a 14.4 fax that was coming in from I don't know where. Actually, I do know — it was from my publisher; it was a 53 page fax of a chapter that they wanted us to proofread. I asked him to send it to me e-mail, and publishers think e-mail means fax.

I was also doing maintenance on the CompuServe forum at the same time that we were in the middle of trying to print some stuff for the next edition of the book and do other things. And as I said, all this on a 16 meg system. It works very, very nicely.

The other thing that you can do with OS/2, and this has been available for a while, is multiple virtual TCP/IP circuits. What that means is that over the same Internet connection, I can have a Telnet session running, an FTP session running, a Web session and an Archie session. Almost any one of the Internet tools or protocols can be in concurrent use without any problem.

Now, the Internet connection and the CompuServe connection are both 28.8 modems. The only thing that I am doing that is different — and we'll talk a little bit about it as we go through the hour — the only thing that I'm doing that is different is using [Raygen's] SIO drivers, instead of the standard COM drivers that come from OS/2. The [Raygen] SIO drivers are shareware. They cost something like under \$50 — and no, I don't work for [Raygen]. I've got no vested interest in any of the companies or issues that I'm going to be talking about today. What the SIO drivers allow us to do is get communications easily from all of the ports. The OS/2 COM drivers realistically don't support much more than about 57.6 or thereabouts.

So what that means is that in the one system, with all of this stuff going on concurrently, we can also have multiple TCP/IP sessions running through the same Internet gateway without impacting performance.

Now, there is an obvious difference between trying to deal with Internet, within limits. Graphic environments are responsible for selling faster processors, and more memory. The Internet is going to be responsible for selling faster modems. And 28.8, if you know that's the ultimate, we haven't begun to see the last of it.

The bottom line is that the limit here turns out not to be OS/2, but it turns out to be the Internet itself. How much can you pump down a 28.8 pathway? Obviously if I had a T-1 or

fractional T, I could do a whole lot more, and we've run OS/2 systems that are connected to a network that are dealing with T-1, doing the same type of stuff, but now dealing with it over a shared network port and a shared modem pool rather than having three separate modems. And again, in those instances, the actual impact on standard work is even less, because in many cases the network adapter handles a lot of the communications stuff for you, and it's coming in at a higher rate and the drivers are more efficient than standard COM drivers where you're looking at having to get a character out of a modem one character at a time.

The other thing that I happen to like about OS/2 is that it's reliable. It stays up. I have a little program that runs every time we boot OS/2 on the desktop system that doesn't run on the laptop systems because it doesn't do anything — the laptop just shuts off to recharge the battery, change the batteries, so that trying to keep track of how much up time I've had on a laptop doesn't make as much sense. But on a 486 DX 266 — when I left Philadelphia yesterday, the system had been up continuously, from the last re-boot, for 27 days and 14 hours. Why 27 days and 14 hours? Because once a month I re-boot the system whether I need it or not.

So, what's going on with OS/2 and the Internet? Why is it a platform that makes some semblance of sense? Warp shifts in two different flavors. There's Standard Warp, in which case you get the Bonus Pack, or there's WarpConnect, which also shifts with the Bonus Pack. But WarpConnect includes TCP/IP Version 3 from IBM, whereas the Bonus Pack is sort of an upgrade of TCP/IP Version 2. The Bonus Pack TCP/IP is designed for serial communication. The TCP/IP that comes with WarpConnect will handle either serial or network communication, so you pick the one that makes sense for you. From either one it doesn't make any difference, the base tools that are installed are pretty much the same.

You can use other providers to get to the Internet, and in fact I do. I use Advantis, I use CompuServe, I use LibertyNet and other providers in the Philadelphia area. When I'm on the road, depending on where I am, I make different choices; but we'll talk about that in a little bit.

There's also third-party tools available for FTP — *Newsreader*, *Gopher* mail, IRC and more, if you want them, so that you're not limited to the IBM tools. And if you're really convinced that *Netscape* or *Mosaic* or some other browser or other set of tools work, you can use Windows variants and Windows tools in OS/2. So if you're familiar with or prefer the *Netscape* interface capability, you can use that, although part of what *Netscape* does, at least in the 16-bit Windows arena — we just starting playing with the 32-bit version for Windows 95 and Windows NT — what it does in the 16-bit Windows arena is simulate threads. Threads are separate executable pads, so that you can have multiple parts of the same program in concurrent execution. In the Windows 16-bit arena, *Netscape* simulates that capability. In the 32-bit area, it actually should use it, but I don't have any personal experience with that yet, as I said.

What you get out of OS/2 is that same capability built in, and in fact you can specify the number of threads that you want the *Web Explorer* to create. Then what it will do in OS/2 is create effectively a virtual TCP/IP circuit for each one of those and download graphics and text concurrently. And now the speed with which stuff comes down depends upon the bandwidth that you get stuff moving through the pipe.

Now, some personal choices. As I said, this is part of what I do, but it's also stuff that you can consider as well.

If you're going to deal with IBM's TCP/IP in either flavor, either on the Bonus Pack or WarpConnect, part of what you can do is connect to the Internet through Advantis. I happen to use, for most of my travels, either Advantis or CompuServe, because they've got more worldwide nodes than anybody else. So the issue is that America Online is a nice service, but if I'm in Europe they don't have nodes that I can get to easily. The same thing is true of Japan, where both Advantis and CompuServe do. There are some areas of the country that America

Online, Genie, and Prodigy — well, not so much — but America Online and Genie have fewer nodes or not quite as reliable service as either Advantis or CompuServe. So because I depend on electronic mail and I travel a lot, I use those guys as providers.

Now, if you have Internet access through your own office and you can call back and deal with it that way, that still works. Basically, the way to pick one of these things is look for the highest-speed, most reliable, cheapest provider that happens to be wherever you are. One of the things that I've discovered is that Advantis has an 800-number and the fee for the 800-number — how many of you travel regularly? Have you ever been in hotels where they tell you the set-up charge for the phone call is a \$1.00 and then you get charged \$.50 a minute? It is cheaper for me to call the 800-number when there is no fee associated with the hotel, and come into Advantis with a 800-number, than it is to pay the hotel charges. So that's something that I keep in mind. Advantis has a global phone list that's updated regularly, and I'll show what it looks like in a little bit. Most in the U.S. are at 28.8.

Of the major services, CompuServe has the most national and international nodes. They have said that within the U.S., all of those will be 28.8 within the next three to six months. Worldwide, they'll be at 28.8 within a year.

So, because of the fact that time is money, I'm looking for the highest speed and the most reliable access. I've found in my personal experience that these two suit my needs better than anybody else. When I'm back in Philadelphia, it doesn't make any difference. I'll come in through LibertyNet, I'll come in through Net Access, I'll come in through Fish Pond or FishNet. Their FTP address or identifier is pond.com — they say everybody is fishing in a common pond. That's theirs; all I did is repeat it, I'm the messenger. I apologize.

The other thing, as I mentioned earlier, is I use [Raygen's] SIO drivers. That allows me to get a 115.2 connection, assuming that the modem is supported. Advantis does support compression, CompuServe doesn't, at least not at the same rate, so there have been times through Advantis where I've seen figures running close to this. Through CompuServe I rarely see more than the equivalent of about 30K to 33K.

Now the other thing to consider — how of many of you have tried to dial in to a 28.8 provider, only to discover that your modem needs to negotiate a 26.4 or a 22.2 rate or something like that? I see that a lot. That's significantly better, obviously, than 14.4. But about 80% of the time, I discover that the modems have negotiated a rate lower than the maximum 28.8 baud rate. That evidently turns out to be just line conditions and standard. Which means, if you will, the 28.8 isn't the limit — it's a theoretical maximum that maybe I'll see some day.

Travel problems in dealing with the Internet. How many of you have multiple e-mail services? I love it — I thought I was one of the few. If you have multiple e-mail services you probably have multiple phone books, you probably have to deal with hotel access. Sometimes I deal with modem-hostile hotels, and that's fun. Have you ever been in a hotel that has a digital system and they do not give you modem access? Or they'll put you in a modem access room, but they'll charge you an extra \$15.00 to \$20.00 a night for it? Ask before you get there.

Part of the problem when you're on the road, when you're trying to merge Internet data, obviously has to do with making stuff work. In the OS/2 area I tend to use a tool called *Linkwiz* from PCX Software. *Linkwiz* is like *Laplink* for DOS, only it allows me to get the file's level and it updates stuff as it needs to. I also can set up to make it do automatic backups.

The other thing that I travel with that has OS/2 driver is the [Brunel] *Zip Drives*. They're parallel port, they're light, compact, and they're a lot better than tape. And the other thing that we'll occasionally do is take stuff out of one service and re-mail on the other so that it shows up on a consistent place.

So [now let's get to the] technical stuff, which is probably why most of you are here anyway.

Getting started with OS/2 on the Internet is relatively simple. There are basically three steps. Now, don't misunderstand, I'm not trying to make light of this. Installing OS/2, like installing Windows 95 or installing NT or installing UNIX, I'd rather leave to somebody else than have to do it myself. Any time you start talking about more than three or four or five disks, then installation can be interesting. So if you can, deal with it by installing it by CD. Anybody here that does not have CD-ROM?

So, step number one, install OS/2. Then either install the Internet Access Kit, if you're dealing with Warp or WarpConnect's TCP/IP.

Once that much is done as step one, the next thing you want to do is register with Advantis, and as I said, I'm talking about Advantis because that's the simplest way that I found to get up and running on the Internet. There are cheaper providers, there are providers in your area. Anyone come from Youngstown, Ohio, or know anybody who does? Youngstown, Ohio, has a "freenet" for their residents, so that anybody that lives and pays taxes to the municipal authority of Youngstown, Ohio, has access to the Internet if they want it, because it's supported by their tax dollars. Certainly if you've got that type of capability then you're going to take a different path to get to the Internet, regardless of the platform that you're using. So, we're talking Advantis here because it's the easiest registration that I've found. It really is simple, and I'll walk you through it.

Once that much is done, you're up and running. If you're using another provider, if you have access to the Internet through another provider, setting up the other provider is different. At that point, what you're going to have to do is talk to the other provider and find out what steps they have or what you're going to have to do to connect to the other provider's application, if you will, so that it talks to their service from OS/2.

CompuServe, by way of an example, will tell you that if you want to use CompuServe as your provider, if you are already a CompuServe subscriber and want to keep everything in one basket, then they give you instructions. All you have to do, literally, is take it out of the file from CompuServe and paste it into the other provider's as a script, make the two or three changes that they suggest that you make to the other provider's icon settings, and you can be up and surfing through CompuServe in a matter of about five minutes, including the time that it takes to get the information from CompuServe. Now, having said that, if the network and communication is a little bit slow, it might take six or seven minutes, but we're not talking about a whole lot of time in most cases.

I'm assuming that everybody knows what a URL is, and since this is an Internet conference that's a probably correct assumption. In case you don't know, it's up there. A couple that you probably want to pay attention to, if you're looking at the Internet through an OS/2 resource: www.ibm.net is the home of Advantis, even if you're not using Advantis as your provider. Whether you're using CompuServe, Net Access, NETCOM or somebody else, if you're using OS/2 as a base in any of the tools you want to pay attention to this guy, because that will tell you if new stuff is around. They also provide some interesting resources and lots of pointers to Web locators, so it's a good resource to be aware of even if you're not using OS/2.

The other thing that you want to deal with is the difference between command line tools, like FTP, and PM tools for FTP. The PM tools provide drag-and-drop, so that if you see something in the remote directory that you want all you have to do is select the items and drag them to the local directory, which initiates a TCP/IP transfer or an FTP transfer.

Conversely, if you want to take stuff and upload to FTP, again you have to deal with drag-and-drop. If you're going to use the command line side, then you have to be aware of commands like BIN or ASCII, etc. You also need to be aware of things, if you want a progress indicator, that there's a hash command for command line TCP/IP that the drag-and-drop PM interfaces will do for you without the overhead, the associated overhead of the hash.

Other things that you can deal with: there's an Archie tool, etc. for OS/2. There's also, if you use IBM's FTP PM or FTP, there are some Net AC file tricks that you can play, including automatically adding the machine log-in and password in a Net RC file. It's an ASCII file.

Now, if you wanted to connect, for the sake of argument, to `walnutcreek.ftp.cdrom.com`, all you have to do from the command line is say `ftp.cdrom.com`. FTP will check the Net RC file and discover that you've got an entry so that you will not get prompted for user name and password. It will automatically supply it so that you don't have to keep typing that stuff. I don't know about you, but I suspect there are a lot of people that learned how to spell acronyms because of the Web.

Getting software updates. Again, if you're using the OS/2 tools, regardless of the provider that you're using, CompuServe — AOL, NETCOM, Net Access, you pick it — you can still use the OS/2 tools to get software updates. And you can also use FTP from `ftp.ibm.net` in the pub directory and then pick the component that you want to update. The way of updating third-party tools is obviously going to vary to some degree.

All right. Now, part of what we're going to do is a brief demo. If you have questions, please ask them. We'll take you through some of the desktop setup, what it takes to register the system, register and get running with Advantis. We'll take a brief look at the Web browser and some of the things you can do with it. A brief look at FTP — as I said, this is not connected, so these are demos.

Now, you know what they say about demos. Frank Baum, author of the *Wizard of Oz*, wrote about demos, "Pay no attention to the man behind the curtain." And obviously what we're trying to do along the way is answer your questions.

So, a couple of things just to consider. From *The Wall Street Journal*, "The change of these networks is generally the easiest, cheapest way for business to communicate electronically with the outside world." [That's] from *The Wall Street Journal* approximately a year ago. My way of rephrasing that is saying, "the Internet is the easiest way for you to pick up anything in the world, transplant it or transport it to your very own desktop."

And finally, this is something to consider: the only dumb question is the one that isn't asked. I also suggest — a friend of mine at NASA said, "You know what rocket science is?" And I said, "Well, I thought I did, but why don't you tell me." He said, "Rocket science results from asking questions — but the actual science itself, where's the rocket science? In the plumbing, in the electricity, in the chemical engineering and in all of the little tasks that go into putting a man on the moon. It only appears to be rocket science when you don't ask questions."

I think Arthur Clarke also put it well. He said, "Any sufficiently advanced technology is indistinguishable from magic."

Contact information if you like it, this will be on the CD as well. If any of you would like handouts or copies of the handouts, plus some additional material that's sort of text, write on your evaluation that you want handouts and we'll get those — hopefully before Comdex, but if not, right after Thanksgiving.

I can be reached at a couple of different e-mail addresses: `davidm2@ibm.net` or `dmoskowitz@cis.compuserve.com`. If you have CompuServe access, 76701,100. My Web page is partial but it will be up and running, and that's one of the things that will be up and running before Comdex, there's some limited stuff there.

[There's also] <http://www.cfsrex.com/unleash>, and phone number information is there. I have business cards as well. So much for the marketing stuff.

Now, let's deal with the high-tech video switcher, a relatively clean OS/2 desktop tool. What we have over here on this launch pad is a dialer. Now, this is the IBM Internet dialer. Normally, the first time that you run this what you'll see is something that says, "Do you want to register or are you already registered?" So once you get there, you open an account, open a

personal account and read the stuff that's there. By the way, I don't know anybody that really takes the time to do that. IBM has lots of lawyers, so they make sure.

Now the other stuff that we do — do this, fill in name, address — pardon me if I don't fill in my credit card type and number, or at least not a valid one. It does try and do some checking and obviously — let's do this, too. Let's see if can preclude some of this. I'm trying to short circuit this, but I really shouldn't, so let's do this and try... That's American Express. I'm not going to put my number in there.

The next thing that you see is a screen that asks you for choices for a user name. You give it three choices and then it says, "Do you want to connect or defer it?" On the fifth screen, push the button and you're up and running. What you end up with is something that looks like this.

And now enter your password, hit "enter" and you're up and surfing on the Internet. It really doesn't take more than about three minutes, if you type everything the way you're supposed to. If you try and short circuit it or give it an invalid card, as you saw, it does enough checking to know there are potential problems.

Now, what we have over here is, while I was typing the password it was looking for the modem, trying to do that on a separate thread. There is no modem that is connected to this system at this time, so obviously it's not going to work. But it would continue to try and deal with that, and once it gets through the modem it would try and make sure it has a connection. Then it would log on to Advantis, and then you get the thing that says you're up and running and surfing. Once that much is done, you can close this thing and just move it over.

We have a series of other things that we could do with the network; if we wanted to we could register an additional user or other users, so this takes us back down the same path that we had before. If we wanted to we could update the software.

Now, here it's asking if we want to connect. I'm going to say don't connect at the moment, in which case what would normally happen is that it would now go out to the Gopher site and fill in that list box that we saw. You pick the item that you want, click "install," and it will download it and then automatically install it. You don't have to do anything other than select, click and install. And while that is going on you can still do other stuff if you wanted to. You can also look at the *Web Explorer*.

Now, if you'll notice, when I had that — let me do this very quickly for a moment. If you'll look down at the bottom you'll see that there's a percentage of the document that has been downloaded and then there's parts of the article that can be downloaded on multiple threads. Now, at 8 megs of memory I don't have more than 4 threads, but I can have — and in fact do on the desktop sitting back in the office — 8 different threads running. What that means is that I have 8 different virtual circuits downloading different parts of the document concurrently.

So if you've got a document with lots of graphics, with each graphic item what the *Web Explorer* does is say, "here's the HTTP of the document," and as it accommodates tags that say "image source" it goes and it starts another thread to go get that image source while it's downloading the document. So what we see looks considerably faster. That was something that Netscape started doing. That's one of the reasons why the Netscape browser has the appeal, because it tries to do some of that as well. The *Web Explorer* actually does it.

Now, part of what we can do is look at some local stuff, and if you do that and just give it a directory then the *Web Explorer* says, "all right, I'll give you a directory as if it was FTP." Now again, this is on the local machine. Notice that what I'm doing down at the bottom; I've got this set up so that I'm showing the current URL here and the link URL at the bottom, so that as I move that — can you see that that's changing, even though you may not be able to read it? Yes, no, maybe?

So now if we select this guy, notice the way graphics come in. You actually see them as they are displayed. That is the way it works, whether you're dealing with it as local files or through the Net. Now, I don't have this entire document set up to deal with it, but part of what we got — if I had left this for the Internet, each one of these things is a button, but if we wanted to we could go get another.

Part of what I'm trying to illustrate with this is a couple of things. Number one, the *Web Explorer* caches documents, so that — notice, I got this one faster the second time; now, yes, it's coming off a local machine, but the key is that it still caches the documents and images. How much of a cache do you have on an 8 meg machine? I'm not going to cache a whole lot. On a 16 meg machine, I'll cache a little bit more. There are times when I use a laptop that has 40 megs on a DX4 100, and if I'm doing demos with that system then I'll cache even more because I want the performance. But the key is that that type of caching is done in the *Web Explorer*, and it makes things significantly easier.

Now, one of the other things that IBM provides is information for the subscriber network. Notice again that you can see the difference in how the stuff is colored. You can change all that if you want to, and in fact, if we wanted to we could come up here to configure and say colors — this is not one that I would suggest, but I'm doing it to make a point. But we could make the background that way, links, we could turn black text into purple and visited links gray. If you really want to you can deal with that as well.

The *Web Explorer* also supports animated icons, so if somebody has their own icon that they want to give you, this guy up here can be changed. It supports the HTML 3 extensions, so if you've got a background that will show up as well without any problem. It also supports the HTML 3 attributes for centering and other stuff.

Quick list. We can add the current document or more; I don't have any added this way because in part, part of what I can also do with the *Web Explorer* is deal with drag-and-drop. So I could take this guy, if I were connected — that's David Barnes' favorite shareware — and drop it. Because we don't have a modem connection, you see <http://www.os2bbs.com>. David Barnes has been abandoned. I can also save URLs using drag-and-drop, so that if this were a file, at the bottom it says "preparing URL for dragging." And now I've saved it.

If I were to restart the *Web Explorer* from scratch, so that it's not running...

[Tape change]

David Moskowitz: I don't remember the complete list, I'm sorry. It comes with the Internet Access Kit, comes with multimedia viewers it supports, standard wave, which comes with OS/2 AU files.

M: [inaudible]

David Moskowitz: Yes, MPEG, TIFF, GIF; I don't believe there's PCX support — yes there is, as a matter of fact.

M: [inaudible]

David Moskowitz: I'm sorry?

M: [inaudible]

David Moskowitz: I don't know off the top of my head. I know it supports standard Apple, IBM.

Okay, what's here? Editor for HTML source, GIF, JPEG, IEF, TIFF, bitmap, RAS, portable any map, MPEG, QuickTime, AVI, AVS, CGI, AU and SND for audio format. AIF, AIFF, AIFC — there's a few of them.

Now in some cases, IBM doesn't supply viewers for all of them. I was trying to give you the list of things that IBM supplied. Most of the sound files that are there — I don't think real audio is there yet, but I don't really know to be sure. I haven't come across too many real audio sites on the Web yet. So a lot of what I can tell you is based upon my personal experience, and while I do a lot of surfing, I'm one person. Anyone here really feel that they're an expert about what's on the Web? Okay, one person. What do you do for a living?

M: [inaudible]

David Moskowitz: Part of what I do for a living is deal with the Internet. A lot of it has to do with helping our clients understand how to use the Internet and be profitable, so that limits the amount of time that we have. We do have one person that does a whole lot of Web surfing, but that's what it takes to be an expert at it.

Part of what we have done with OS/2, by the way, very successfully with beta software, is use *EM Bone*. How many of you are familiar with *EM Bone*? *EM Bone* is videocast on the network, on the Internet, and it's real-time video. We've found very good use for *EM Bone* in an OS/2 environment. We tried beta software for Windows 95. Windows 3.1 and its derivatives don't really handle it. Windows 95 has problems. The best two Intel-type systems to handle *EM Bone* graphics today — and I'm going to make the assumption that it's within limits, probably true to some degree for real audio — are NT and OS/2. UNIX will obviously handle *EM Bone* very well. Like I said, I'm not trying to take anything from away from the UNIX environment. I spend a lot of time using it myself.

But the key is that this is the list of supported browsers that you can add in, including, for those of you who like UNIX, TAR — or I think I saw in here the PKZIP format. The reason that I started this...

M: Since a program didn't come up under that [inaudible], that means it's not included?

David Moskowitz: I did not configure this one for it, because on 8 meg I just did not take the time to do that. And for ZIP files, normally I wouldn't want a viewer or something like it. I want to download it directly to my system.

M: I'm just curious, like [inaudible] viewers that are set up in OS/2, will that viewer pre-configure [inaudible], pre-configure all viewers at the basic [inaudible]?

David Moskowitz: Yes. I don't know if any of them will show up here — there's one, so yes. So you can see the stuff showing up. You may not be able to read what's there, but you can see that there is some stuff in the program area. Those are the default viewers that are set up.

Now, I don't know if you watched what I did, but to get this page back all I did was drop the URL and just drag-and-drop it. Because of the fact that OS/2 supports the work place shell as a COM interface and *Web Explorer* participates in that, you've got full drag-and-drop capability. Not only can I drag the current URL that I'm looking at to a folder or the desktop, I can also drag the document. I can drag a GIF image if I want to, or a graphic image. So if I wanted to take this graphic and put it on my desktop, it's now sitting there as a GIF file. I could drop it back on the viewer if I wanted, using the *Web Explorer* as a viewer to actually view the

bitmap, with complete drag-and-drop capability. In any of the viewers that are supported I could either double click on the item on the desktop or drag it back to the *Web Explorer* as a viewer.

Other things that are supported: if I deal with FTP PM, and I don't want to connect, part of what I would do is fill in the host URL minus the FTP adjuster locator, the user ID and the password and again, if I have a Net RC file for OS/2 FTP PM, all I have to do is fill in the host and it will grab the user name and password from the Net RC file.

We're not connected, so we won't see anything here. It can't get to the host, so it's obviously not going to go anywhere, but what we would next see is this type of interface. What we'd see down here in this area are the remote files. Again, to transfer something all I have to do is drag-and-drop it. That would automatically send it. Going the other way, if there were files in this list, I could drag them and drop them going the other way as well.

M: Does your system support VRML [inaudible]?

David Moskowitz: I'm sorry?

M: Does your system support VRML [inaudible]?

David Moskowitz: Does my system?

M: Or [inaudible]?

David Moskowitz: If they're available, certainly.

Other tools. Now, what I'm showing you comes with OS/2. There are third-party tools that replace all of these, so you can deal with third-party tools if you want to. Gopher is the same way, and again you'd see the Gopher menu that's there, and you could click on that or deal with a series of menus to open up the Gopher if you wanted to.

M: Does it cost anything?

David Moskowitz: It's free.

M: [inaudible]

David Moskowitz: It comes with, on the Bonus Pack, with OS/2 Warp or WarpConnect. And you don't need the Bonus Pack with WarpConnect, except for the multimedia viewers; but it's included in the base package. So I don't know what the street price is of OS/2 these days, but my guess is it's probably under \$100 for Warp and probably about \$120 to \$140, somewhere in there, for WarpConnect — but it includes TCP/IP. In fact, one of the other things you get with WarpConnect, having nothing to do with the Internet, which is why I didn't mention it, are things like peer-to-peer networking, including the ability to share modems in a peer-to-peer network, sharing printers on a LAN distance server, if you're interested.

If you've got a mainframe site or somewhere that's running a LAN distance server you can connect to the other network and have access to the entire network remotely; or have just a peer-to-peer arrangement where two LAN distance clients can talk to each other and stay within the same machine, without getting out of the network. So depending what you're doing, WarpConnect makes some semblance of sense.

As long as I've got a few minutes, how many of you saw the *New York Times* article around August 1st, in which Gerstner was supposedly quoted as saying that IBM is abandoning the desktop? Anybody?

I mean, the bottom line is that it was not handled very well, either by the *New York Times* or by IBM. The guy that wrote the article — my cousin is a securities analyst and knows the author of the article — the author was not present at Gerstner's speech, so I'm not sure where all of the information came from. But the bottom line was that the author wasn't present at the speech.

The other issue is that if you look at what IBM is doing and where they're going, it's not going to be too long before almost every single computer, every personal computer, is connected to something. It's either going to be a network — that we think of as a LAN in an office environment — or dial-in to an office network, because a whole lot of companies are now allowing people to work from home, or they're dealing with office sharing as a way of cutting down on real estate costs. Or people are going to be connected to some other network, like a CompuServe or an AOL or a Genie, so that's it not going to be too long before all most all of us are connected.

IBM's Networking System Division said it very distinctly about a week and a half ago at Colorado OS/2, which is, in my opinion, a premiere developers' conference for OS/2 developers. What they said is — and it's the best answer and it's the answer that IBM had given, and the response that IBM had given back in August — they said the reality is that it's not going to be too long before everybody is connected, and what IBM is trying to do is deliver platforms that work in a connected world.

Well, the question was asked, "When you said everybody is connected, do you mean everybody in an office or everybody at home?" They said with cable companies, telephone companies, everybody competing to try and deliver service to all of the subscribers, both home and business alike, we want to be a player in that area.

So if you view what Gerstner said about networks in that context, it's not a question of OS/2 abandoning the desktop, it's a question of recognizing the realities, which is what I would personally like to see IBM do.

To emphasize the point, a couple of things. Number one, drop the current Warp package. Then take WarpConnect, drop the price of WarpConnect so that it's in the same basic price range. Obviously it includes a little bit more so it would cost a little bit more, but have the price for WarpConnect be close to what Warp is today. One product without the confusion; because what we have today is Warp with OS/2 and without, WarpConnect with OS/2 and without, so IBM is now supporting four different products called Warp. I'd like to see it be effectively one. Then the only question that you have to ask is, do you have Microsoft Windows, or do you want IBM's version of Microsoft Windows? That would make the message a lot clearer, particularly if it's priced so that it can be purchased both by business and by home. That, I think, would make the message that IBM is trying to deliver a lot clearer.

Having said that, I don't work for IBM. The requirement of my company is that we are not allowed to own stock in any of the companies that we either have as clients or might have as clients. We do not have fiduciary interests in IBM or any of the other companies that I've talked about with you today; so it's not a matter of conflict of interest in trying to promote something that's going to make us money, because that just isn't the case.

IBM has perception problems, and I'd be lying if I told you otherwise. How do you deal with the perception problem? Don't talk about it, do it — it's that simple.

Are there any questions?

M: When you were explaining the [inaudible].

David Moskowitz: The default value is four. You get four threads if you don't do anything. If you wanted to change that, then what you would do is come up to the *Web Explorer* icon, open its settings — where I have a “q” here that says, “Don't give me the message you're about to start the *Web Explorer*, and don't ask me whether I'm sure if I want that, I want to end.” In other words, “quiet.” The next parameter that I would add would be if I wanted eight threads, and then when the *Web Explorer* opens you'd have that number of threads.

M: [inaudible]

David Moskowitz: Actually, if you look at it — I'm not going to tell you it's intuitively obvious, that's a phrase that I have grown to abhor — but the *Web Explorer*, if we bring it back up, for the most part it's configured. If you add multimedia browsers those things are automatically added by “install” so that you don't have to worry about it. For the most part, the way that it comes is like this, without the current URL. Then if you look at the bottom, as I track the mouse over the buttons there's help for each of the buttons.

But for the most part, in what we've seen in talking and working with people, it takes them anywhere from 10 to 15 minutes to an hour and they're up and running without realizing that they're surfing the Net. And particularly with the PM interface.

If you're talking about a command line interface, MGET, binhash prompt, and the rest of that stuff are enough to drive anybody nuts. And if somebody has to learn a command line interface to deal with the Internet the chances are very good that they will find other things to do with their time. That's like telling people that UNIX has the best interface in the world. Now you know better than to try to make any sense out of that.

And oh, by the way, don't forget to put the pipes in where they belong. I mean, that's one of the reasons that UNIX does not have a larger appeal. I don't know about you but GREP never made a whole lot of sense to most people, even though I know it's “generalized regular expression pacer.”

If your dealing with a GUI, depending on the care that was done with the GUI, for the most part, if you look at and if you take a few minutes while I'm doing this, we'll do a drawing for a book and then I'll let the next speaker set up.

Once we get something in here it's a matter of selecting it from the list and then pushing the “install” button. The user doesn't have to know anything else, they don't have to know how to deal with installing or putting things in the right directory.

M: It's pretty obvious.

David Moskowitz: It is, and with an FTP file you get “get” or “put” and the local, whichever file you have highlighted — they've tried to build some intelligence in to it so if you've got a file highlighted under a local directory under “file,” the menu item that you see says “put.” And if you've got something highlighted in the remote directory, the file item that you see is “get.” If you've got both highlighted, things could get interesting. There are third-party tools that frankly, in some cases, have done a better job, both for the *Newsreader* and FTP.

But the key is what you're looking at is a graphical environment that buries some of the Internet complexity. Remember — how many of you have used the Internet for two or three years? And if you remember before there were graphics stuff, there was command line, and everything you did, Telnet, FTP, Archie, WAIS, was all command line driven. There was a different set of commands and a different set of syntax for each one. You really understood that

the Internet was a process that was designed by committee, because every single one of these things had a different way of dealing with it.

Not only that, if you took it one step further, you could go to different Archie sites, WAIS sites, etc., and the way that the information was organized was different. So the elliptical nature of the Internet shows.

Any other questions? If you would take your sheets and pass them one way or another, and he'll get some and I'll get some and we'll do a drawing and give away a book.

Thank you very much, I appreciate your time and effort. Was this helpful for you, I hope? Good. And again, thank you very much.

INTERNET TECHNICAL THE “HOSTED” WEB SITE: WHAT YOU NEED TO KNOW



MODERATOR
Ivan Pope
Webmedia

SPEAKER
Joe Peck
Product Manager, Internet Server Services, Digital Express Group

Joe Peck: ...it doesn't have to be on your computer. It can be on any computer that's up on the Net. The only real requirement is that the computer needs to be up 24 hours a day, 365 days a year. And it needs to have good conductivity so that you have adequate response to your site. And then the other thing is, you want to make sure it's got adequate system performance; you don't want to be putting it on an underpowered machine. So really, I think those are the only three requirements of having a Web site. And based on that, there are a lot of computers out on the Internet that fulfill those requirements.

You see a lot of sites that are on computers at universities, but typically they aren't taking paying customers. So what you want to do is find the best computer on the Internet to put your Web site onto. From my perspective, when I was looking at putting up a Web site initially, when I quit my job and tried to start a Web company — how many of you people here have done that? At least one, yeah.

I went to an Internet provider because they had the best computer for me to put [the Web site on]. I'll talk about it in a while, why the Internet providers, in my opinion, are the best place to put it. But at that time, they didn't want to do it, they weren't in that business. Nowadays, a lot of Internet providers are in that business.

I should mention I work for an Internet provider and yes, we do this stuff. I'll try to be unbiased about the whole thing here as much as I can.

You have choices. You could put the computer on your site on your own computer, on your own network, provided you have Internet conductivity, or you can put it off-site at somebody else's computer. You know, a lot of people, even though they have conductivity to their own place, are still looking at putting it somewhere else.

Some reasons you might want to do that would have to do with the fact that a Web site may bog down your circuit. You may only have a 56K line, or even a T-1 circuit to your site, and a lot of the traffic to a Web site can bog down the conductivity for the other purposes you're using that connection for. So for example, a company like Digital Equipment Corporation — or let's not use that as an example, I used to work there. A lot of companies may have a 56K line, and if they put a Web site up, all of a sudden 90% of their bandwidth is being eaten up by their Web site. They may want to look at putting their Web site off-site at some other place so that their bandwidth isn't being used up by the site.

The other reason to put it off-site is that your Web provider, your Web hosting site, may have a more reliable connection than you have. They may have a 24-hour support staff, or they may have redundant circuits — in case one circuit goes down, they've got a backup circuit. That sort of thing. Or maybe you just shut your computer off. I've seen systems people do that; they go home at five, and they shut off the router. It's true. So you may not have the most reliable circuit or it's not going to be up 24 hours a day — you can't count on it. So you may want to look at putting it someplace that is.

And by reliability you want to factor in things like power backup, a 24-hour network operation center keeping a watch on things, that sort of thing.

The other thing that Web hosting sites may have is better network support personnel, or a better network support infrastructure where they've got an automatic trouble-ticketing system, and they've got tools to monitor the systems to make sure they're always available. That sort of thing that you may not have in place.

A lot of people don't want to go out and hire an administrator to run their Web site when they can just pay somebody else to do the work, and typically those people are more experienced at systems administration and doing backups, all that sort of stuff. I'll talk a bit about that later.

There are also security advantages. A lot of people see a Web site as a high-visibility target, and they don't want to put that at their own place; they want to put it somewhere else so that at their own site, if the Web server is compromised their own site isn't compromised, because the Web server isn't even there. We actually hosted a three-letter agency for the government; we had it running on one of our servers because they didn't want to put it at their own place. It's the kind of thing that you can put your Web server off your site, and that way if somebody breaks in there, so what? They're not inside your network.

And then you may be able to get more Web expertise at the provider's site, too, because a lot of these folks are doing this — they're keeping abreast of the latest technology and they can let you know that yes, we've got this capability now; whether it's real audio, or *Java*, or some new database engine — that sort of stuff that a lot of customers just aren't aware of.

So those are some of the reasons to look at putting it off-site. But I haven't yet talked about who's doing the hosting. Who's offering these services? And why is one better than another?

I see three categories of companies that have gotten into this business. The first one is the start-up Web development company — four people go off, or even one, and they get a 56K line to their garage or to some small office, and they put up a couple computers and start arranging space on it. Six months ago they were running the Web server for their department at the university, and now they're developing Web sites for people, and they're hosting the site as well. Typically, in this case they've got expertise in developing the Web sites. They may have a lot of Mac skills and graphic skills. Almost always, they don't have the network infrastructure, they don't have redundant circuits, they don't have a 24-hour support desk with somebody on-site. They may not even have spare hardware in case the disk crashes, or something like that.

What I think is the worst — I don't want to denigrate these folks because a lot of them do really good work in developing the site, that's why you see the split as being nice — you can have folks like this develop the sites but put it somewhere else, because most of these folks don't have a clue about network security.

Whenever I give this talk, one of my favorite scenarios is when — how many of you were around when the Internet worm happened back in, I think it was '89? The worm broke into one computer, found out what other computers knew about, and branched out from there and just spread like wildfire. I could see somebody modifying a Webcrawler that crawls around and follows URLs. They could modify the crawler and toss in a break-in tool that crawls around the Web, breaking into as many sites as it can and replacing all the GIFs it finds, all the in-line sources. I think that'll happen. I used to say that 95% of the sites were vulnerable; I think it's a bit lower now. But a lot of sites just could be broken into very quickly by someone who knew what they were doing, because a lot of folks just don't have any clue about network security.

So other folks are offering service or that have gotten into this business of "We'll rent you space on our server or at our site." It's never consulting companies; they typically are people that have gone and they already have connectivity to their site, maybe a T-1 line or a 56K line, and they know how to run servers. So they can put a couple extra computers in there and start renting space. They typically have better system administration skills than the HTML

development companies that have gotten into the business, so they're more likely to have a secure computer, and be less vulnerable to break-ins.

But the things they tend to lack would be the 24-hour support, because there's not usually somebody there 24 hours — although if they're in the business a lot of them do carry pagers around, because they're doing that for the customers they're supporting network-wise as well. They are never consulting customers, but they don't tend to have the network infrastructure you'd want to have, with redundant circuits and power backup and that sort of thing. But at least they know how to run systems so it's less likely to be broken into.

The next category I see would be the Internet providers, because they're already running networks, they are already running computers, they have the bandwidth. It's nothing to them to put another computer at their backbone site, their point of presence. The nice thing about that is they usually have redundant circuits — if one goes down, they've got plenty more that the traffic will just flow over transparently, and you don't know that a circuit has gone down. We actually had a T-3 circuit go down, and all the traffic went over another T-3 and nobody noticed. So that's nice.

Power backup — usually they have uninterrupted power supplies. If the power is out for five or ten minutes, there is an array of car batteries, basically. Or if they're really into this they'll have a nice big power generator, a diesel generator. With a UPS, an uninterrupted power supply, that'll only last you five or ten or fifteen minutes, depending on how much you're trying to power. So it's nice for the power surges and for brief power outages, but it won't last for an hour or two or a day. So the ones that are really into this have the big power generator and they can keep the stuff going forever.

Internet providers typically have a heavy focus on network security because they've had people try to break into their sites before. What usually happens is they end up working with Web developers, so they may say, "Yes, we'll develop your site for you, we'll do the whole thing for you," but usually they're farming out the Web development, the site development of the content. Or they may say outright: "Yes, we just farm it out, and this is the developer we recommend or we work with," or whatever.

One thing to note is if you go to Yahoo and look for an Internet presence provider — what is a presence provider? There is confusion as to whether that's an Internet service provider that's going to give you conductivity, or an Internet presence provider that's going to develop your content for your Web site, or a company that's going to host your Web site. So you want to distinguish between the two terms: Internet presence provider and Internet service provider, service provider being the one that just provides conductivity.

Any questions yet? Am I going too fast or slow or along the right vein?
Okay, I'll get into this just a little bit more.

One thing to note is that not all Internet service providers are equal. Just anybody nowadays can go out and get a 56K circuit, which is not much more than — it's only twice as fast as your dial-up modems, your 28.8 modems. They can get a 56K circuit, put in a Sun server and a rack of modems, and they start signing up customers — they're an Internet provider. And that's why we have, I think, about 2,000 Internet providers in the States now, last count I saw. We have 60 down in the Washington, D.C., area where I live. And so a lot of people say they're Internet providers, but there's a wide range of those.

So the things that distinguish the Internet providers from each other would be the amount of bandwidth they have; how fast their circuits are; the support — it really ranges from nonexistent up to 24 hours that you can get a human being on the phone on-site. We had a salesperson who was competing with some hosting service, and so I said, "I'll call him up for rates and compare," and I didn't get an answer on the phone — it rang and rang and rang. And

then I noticed that their address was a post office box, and so that right there convinced the customer not to go with them.

Support is a really big issue. If your site goes down, or if you have problems getting to the site so that you can update the content, you definitely need support. Bandwidth and support, I think, are the two biggest issues.

Conductivity. When I say network infrastructure, there is bandwidth as far as how fast the circuits are, but conductivity is whether the circuits are redundant or not. One circuit going down should not drop your site; there should be a secondary and even a tertiary circuit so that your site is always reachable, even if a circuit goes down.

Another thing about Internet providers is that a lot of times they'll oversell their bandwidth. They'll get a T-1 line to their network, and they'll sell T-1 lines to their customer — you know, eight, ten T-1 lines sold — and so all eight of those T-1 lines are being carried over the Internet provider as one T-1 line. That degrades the performance getting to your Web site if you're one of those customers. There's a case I know of where there was a provider that had eight T-1 lines to one T-1, and there was a Web hosting service who was one of their T-1 customers. So that's one thing you want to look at. How much are they overselling their lines? Everybody in the business is overselling it to some extent.

How many have heard of the network access points? This one guy keeps raising his hand.

I think I have a picture right now, but the — I said there was 2,000 providers out there. If you're a customer of one, how do you get to a computer that's at another provider's site? Or if you're on America Online, how do you get to a Web site somewhere else? Basically these networks interconnect at certain places, and those are the network access points. The one some of you may be familiar with is called the KIX, the Commercial Internet Exchange. That was where initially there were bilateral agreements where one provider would hand a circuit over to another provider so their customers could get to each other.

And then there was a consortium, the Commercial Internet Exchange, where a lot of the providers ran circuits down to one place and connected together at that one point. That was one of the first network access points, out in Santa Clara. And now the main one is the [inaudible], the Metropolitan [inaudible] Net, it's actually fiber now, but it's still called the [inaudible]. That's in Washington, D.C., and that's where the major providers connect in with T-3 circuits or higher-speed circuits.

And so your Web site may be quite a ways away from that interconnection point, which means that all the people coming from those other networks then have to traverse a longer path to get down to your site. So you want to be as close to that interconnection point as you can with your Web site. Down on the right you could put your Web site, you could put on your own network on one of your own computers, but your connection may range from 2400 baud up to T-1 speeds. Physically, most people don't have greater than T-1 these days yet.

Or you may go with a Web hosting service down on the left corner, and they may have a 56K line all the way up to T-1. Some of them have — no, I haven't heard of any having anything higher than that. But you notice that there is no redundancy there — if that circuit goes down, your site is down.

You may go with a small Internet provider that's got a 56K line or T-1 line, or somewhere in between that, but they don't connect directly into those network interconnect points. They get their service from a larger provider, and that provider may get a [inaudible] activity from another provider. And so you may be quite a ways down the chain. At each point there is bandwidth overselling going on, too, so you want to be at a place that has redundant circuits and high-speed circuits, and is close to the interconnect point. But I think that's as technical as I want to get on that, because that's really delving down in there.

Anyway, getting away from the bandwidth stuff — really, in my opinion, bandwidth is one of the key issues, but nowadays a lot of people care about other things.

Pricing structure is a big one, and I'll talk about that a bit. How loaded the server is — if you're paying to put your content onto a computer, how loaded down is that computer with other things, other customers, possibly? Also what is the server platform?

Do we have any folks with their Web sites on an NT server?

Most people are on a UNIX system. Some people want to be on an NT server because their database is in NT, and they have some application on NT and so they want to stay with that. So you have to look at things like the operating system.

The hardware — what capacity is on the server? How many megabytes of space do you have on the server? That sort of thing is important. How much RAM there is on the server is going to affect its performance as well. And whether you can upgrade — as your site grows, are you going to be able to add more disk space to it? And what the cost is of doing an upgrade?

How your URL looks — is it going to be www.yourdomain.com? Or is it going to be www.provider.com/yourcompany? I'll talk about that in a second. But again, support consideration is getting to be larger and larger, because if the server goes down you want to make sure you can get somebody on the phone who can bring it back up. If you want to add an account, or if you have to upload new data to the system, you want to be able to do that.

And security, in my mind, is a big one. I was talking to somebody from the Boy Scouts at the national level, and the experience they've had with regional Boy Scout affiliations going on-line with Web sites was that people would break into the site and change the content. The national organization is not on the Web yet, and won't be until they figure out how to make it secure. I think that's interesting that the Boy Scouts would be broken into.

Access to the server and control of it [is an important consideration]. When I talk about access, that means you have access to the directory where you can put CGI programs, where you would want to put programs to process Web forms — that's the common gate where you interface. And some providers may not let you have access to that for various reasons, because then you're actually running your programs on the provider's system, and depending on how you wrote the program you may cause performance problems on the server or you may even bring it down if the program is written poorly. And if there are several other customers also sharing the same server, so you are going to basically hose over everybody else. A lot of times the provider will say, "Well, you can't put programs on the server," or, "You can use this library that we've developed," or "Give us your program, we'll look through the code and make sure it's okay, and if it passes muster then yes, you can use it." So that's one of the problems with a shared server that I'll talk about in a bit.

Server capabilities — things like whether you have a database engine on the server, so you can put your [inaudible] database on there, or if there's a search engine available as well. A lot of times the server is just bare bones and you can just put [inaudible] on there, straight files, and you don't have the interactive capabilities. You don't have the necessary tools to do the interactive stuff. So things like the programming environment... Most of your CGI programs that do the foreign processing are written — actually they're usually written in [inaudible] or C, or another language called "Tickle." And so you want those programming environments or those interpretive [elements] available on the system. And you may want *Java* on the system as well.

Who's doing anything with *Java*? Anybody? A few. Anything interesting you can talk about? Not yet.

The last thing on bandwidth — I think I've addressed that enough. Bandwidth, I'd say, is most crucial, and redundancy is critical — both in the circuits and in the power. And then again, how far you are from those network access points.

Actually, I was talking to somebody on the way in and he said that there was a hosting site that somebody was on, and they were at the end of a T-1 line and that hosting service then took on *Penthouse* magazine's site as a customer. And this other customer was very upset, because now all of a sudden nobody could get through to their site at all. That's what happens, so that's the consideration to worry about. And here I mentioned, again, bandwidth overselling, so I won't go into that any more.

Pricing structure is the one that I think most people that are having to pay for this are concerned about. I see that there are three or four pricing structures that are out there. And let me know if there are any I miss here, because I'd be interested

I've seen usage-based pricing. That initially was the most common, and that's where you would be charged based on the number of hits that your site was getting, the number of accesses to the site. People have backed away from that, and now they're saying they will charge for the number of megabytes transferred off the site per month, and they'll give a range. But again, that's usage-based, and what they're really saying is, "Well, you're bogging down our network connection, our circuits, and if you have too much traffic to your site we're going to have to put in more conductivity, we'll have to put in another T-1 circuit or we'll have to upgrade to a T-3 or something." And so they're charging you based on how much you're using their bandwidth, their network.

And then there is content-based pricing, which is really interesting. I only know of one provider doing this exclusively, and they're trying to say: "We don't charge you for usage, so we'll charge you this way instead." And this company is charging based on the number of files you have. Each file will cost you \$50 per month, or \$5 per month if it's a small file. And not only that, they go beyond that and they say, "Well, if you have a hyperlink in your file, we'll charge you \$5 for that, too — \$5 for every hyperlink." And what's really strange is they say, "If it's a hyperlink to your own file on your own site, it's so much; if it's a hyperlink to some other site, we'll still charge you for it at a different rate."

That, to me, is just completely insane because to the person running the site it is just another string of text in the file; it doesn't affect that site at all. But they're actually charging for hyperlinks in addition to a base floor price. So, yeah, they're not charging for usage, but they get you some other way.

The way a lot of places are charging is actually based on the capacity of the system. So they say, "We'll charge you so much for 25 megabytes on the server; or if you want a Sparc 2, it's this much; if you want a Sparc 20, it's a lot more. And so it's basically things like how much disk space, how much RAM is in the system and how powerful the system is. But typically the biggest one is usually disk space you've taken up.

And then a lot of people will combine these and they'll say, "So much for this much space, and then we'll also charge you based on how much usage to the site as well."

Has anybody seen any other pricing structures? No? Okay.

I think really that those are about it. Now, with usage-based, the problem with that is that it's hard to forecast. If you're having to pay for the system and you want to budget for it and put it in your yearly budget, let's say it's going to cost this much; well, you don't know how much traffic your Web site is going to get, so how do you put that in the budget or a forecast? You mark in the maximum number, I guess.

And worse than that is that there are robots out there, these indices like *Lycos* and *Yahoo*, and things like that, search engines. A lot of them are Webcrawlers that go out and explore the web and follow links and find as many pages as they can, automatically — they're robots. And while that means that's more traffic that also means they're pulling data off of your site, and that's driving up your usage. And yet all it's doing is possibly building an index, and hopefully it's one that people use.

I don't know how many robots are out there nowadays, because all these graduate students are looking for cool things to do at school, and they're writing robots. I'm on the robot's mailing list, and they're doing some strange things. You can actually put a file in your content, in one of your directories, that says "robots go away." So ask your Web developer about that.

How many have heard about that robot.text? Use it judiciously because, yes, you do want to end up in a lot of these indices but you don't need them canvassing your whole site.

What I think is most interesting about usage pricing is that, let's say you have somebody who gets mad at you, and they know that you have a Web site, and maybe they just guess that you're being charged per traffic. They could easily write a program that just keeps pounding on your Web site. All of a sudden your usage is again up to the maximum price. That might be a vindictive ex-employee, an irate customer, maybe somebody who's trying to do what's called a "denial of service" attack to your site, where they're just pounding on it so much that nobody else can get in there. And, yes, people do that. I would never [do that].

I think what's most interesting is that maybe it's the provider's competitor, which I would never do. But it's occurred to me that it would be very easy to do that. We could sit there and pound on some of these other hosting sites, and then call up their customers and say, "Well, we have flat-rate pricing." But, no, I'm too ethical for that. So that's something to consider in the pricing structure.

I mentioned the content-based pricing, and I just see that it's a feeble marketing attempt to say they don't do usage-based pricing. And to me, it's really feeble, because they're charging for hyperlinks to other sites, and that has zero impact on the server. It's just amazing.

And the other thing about that is, how many of you have sites that have shrunk in size over time? How many have grown in size and added more content? All your hands, yeah.

These sites grow, and you want to add more to it, and you may want to put a library — maybe you want to create an index of things that are of interest to your customers. Well, if you're being charged for every hyperlink or you're being charged for each little icon, that red ball next to the thing, or whatever, yes, that's a separate file and you'd be charged for that. So it discourages you from enlarging your site or creating more content on it, because it's going to affect how much it costs you.

So capacity pricing — the thing on that is to make [inaudible] make sure you can add capacity as needed. And that the upgrade cost isn't astronomical; the nice thing is that it's very easy to budget if it's flat rate.

Any questions on that one?

Okay, aside from the pricing structure, the server itself — we're going to look at the capacity of the server and what they're using it for. The big thing is how many customers are sharing the same server, because if you're sharing a site with *Penthouse* magazine your site is going to be inhibited as to the performance of people being able to get to your pages, because the server is so busy handing out pages for this other customer.

I've seen this. This friend of mine had a Web site he was paying to have hosted. He was getting 3,000 hits a day, which is trivial, it's nothing, and yet there were times when people would connect to his site and get "server too busy" error, "try again later." What that was telling them is was that the server is too busy because there's 80 other customers on that same server, and some of them are busier than his. So you want to look at that because, I think, initially when providers get started they may only have three or four or five or ten customers on the same server, and the server performance still looks okay, but as it grows... I saw one site that had 120 customers on one computer, and yeah, let's hope they're all low volume, low traffic. I suppose what you could do is ask the provider, "Well, what's the maximum CPU load going to be before you start putting customers off on separate boxes?"

Oh, this is funny, too. I saw one provider that says, "Yes, we have dedicated Web servers." What they're saying is, "Yes, these computers here are just hosting Web sites, and that's all they do. They're not running news or mail, or anything like that." But they're still shared. There are still ten or twenty customers on it. So it's not dedicated just to you — it's a dedicated Web server with ten or twenty customers on it.

The other thing about shared servers is that the CGI programming is where you run into restrictions and problems, because a poorly-written program can bring down the server. Let's say this program fills up the disk. All of a sudden that server is no longer going to take connections; it might actually do something stupid like crash the system or go into an infinite loop, and cause performance problems on the server. So because of that, a lot of providers do things like request to review the programs or say you can only use the programs written in their library, written by them, or you can't put CGI programs on there at all.

CGI is the interface that makes your site interactive so people can send you feedback, so people can fill out an order form. Any of the form stuff has a program behind it on the server that processes that form, and that's what we're talking about. So you want to have CGI access, but again, you don't want other people on the system with CGI access doing things that are going to hurt the site. So what do you do about it? You get a dedicated server.

The other thing beyond that which represents a security problem is that usually each customer has an account on the system or some way to upload files, and if one customer's account is broken then the rest of the sites are vulnerable, too. I've seen that happen where one site was compromised, and all of a sudden all the data was deleted — so all 20 sites went down. Just things to consider.

I'm glad they put this in the technical session series. How am I doing here? Is it going okay?

So, [those are] shared server lessons. Ask these people how many customers are going to be on that same server. How many other sites are there? And not just number of customers, but what's the maximum CPU load going to be? Ask whether there are going to be CGI restrictions.

Our company does dedicated servers only. Each customer gets their own dedicated computer, and there are no other customers on it, because the biggest thing is — how do you know that one site might not get really busy and cause performance problems in another site? If it's shared, how do you do resource allocation and do it fairly, so that each get a slice of that computer time? That's pretty tough to do. So if you really want to get extreme, ask for guaranteed server availability.

And ask them what their security mechanism is. How do they prevent security problems if they're giving each customer an account? Or in the upload process, what's the security mechanism for — let's say one customer is uploading their data and they actually overwrite your data accidentally? How do they prevent that? Most of the sites that are out there doing hosting are shared servers, because it's very easy for them to put up one computer and just start tossing customers on it. [Inaudible] four or eight gigabytes of disk, and then most sites aren't that big.

How many people are hosting a site, and they're sitting on a shared server or know if they are? How many don't know?

That's all I have about shared service.

If you have a dedicated server you get around a lot of those issues. There's usually no CGI restrictions because you're the only one putting programs on there — it's your machine to play with. Usually you'll get an account on the system, or even more than one. A lot of times on a shared server you don't actually have an account on it, they give you a space that you can upload files to. Or maybe [inaudible]. I'll talk about that in the upload process.

The thing about a dedicated server is then you can do other things on the system aside from it just being your Web site. It could be your mail host or it could act to hold user accounts for you. We've had customers that have put a couple hundred user accounts on there, and that's where all their user mailboxes live is out on that server; and they run it as a POP server so that all the mail comes into there, and people dial up, people connect into the Internet, and then pull their mail off of it — their own association members or whatever. So that's something you couldn't do on a shared Web server, because it's not designed for that.

We even have some customers that get root access to the system, which you would never get on a shared server. Root access in the UNIX world means you have complete system privileges and can do whatever you want with that system. And that's nice for customers that really want to administer the system themselves, and put some fancy new Web server on it, or some database engine or whatever, that the Web hosting site doesn't support yet. So if you're on the leading edge you might want to get root access.

Here's the one most people know about, and that's the URL appearance. Your URL should be `www.yourdomain.com`. And I'd say insist on that.

How many have heard of PETA, the People for the Ethical Treatment of Animals? Yeah, they're on a site that's doing environmental organizations, I think it's in [inaudible] or something like that. So their URL isn't `peta.org`, which you would expect it to be, it's [inaudible] `org/peta`. So somebody out there registered `peta.org` and they have a Web site up, and I think it's "People Eating Tasty Animals." Check it out, it's funnier than anything. They have meat packing companies, they have fur companies, they have leather stuff. That actually is somebody where I work.

So anyway, get your own domain, your own identity. You're going to want it a couple of years from now so you might as well get it now. I don't care what anybody tells you — get it now, because you don't want that to happen.

So with a lot of places that are doing shared servers, though, you can do a trick with the shared server. You have each domain for the different customers; they each have their own domain, but it's pointing at the same machine. But what happens is that you're pointing at the same Web pages, and so you start off with a single Home Page. How do you give each company their own Home Page without specifying a slash and a path name? They do some trick by giving the computer itself different IP addresses, and then each domain name gets their own IP address, and they're doing something that's called "Virtual Hosting." That is the term that's being used nowadays. But some providers aren't that clever, so they do `www.yourdomain.com` and you get your own domain, but you have to put additional information — `/your company`, or something like that, to get down to your specific Web pages rather than a single common Web page that all the domains are going to point at.

So don't go with that because those people just don't know what they're doing. Your customers will go to `www.yourdomain.com` and not put the extra information, and they'll usually get to the Home Page for the Web hosting service, which should at least have a link listing the customers on this system. But you don't want to have to deal with that.

So go with the Virtual Hosting, or go with the dedicated server where your domain is the only one on that system. And what's the worst in that is when it's not your own domain name but the provider's domain name and then an extension/your company to get down to your files, because then you don't even have your own domain.

If you get really cheap, at a lot of places you can get an account, a regular dial-in account, and you may have space on a Web server as part of that. And so a lot of people have their personal Web pages up — and I don't know if you can see it on the bottom there — it's tilde and the user name, and that will actually look in the user's directory, their home directory, for the files. So that's even worse, because a lot of people out there just don't have clue as to what

a tilde is, and so they screw up when they're trying to type in the URL. So you don't really want to have to deal with that. The best ones are at the top, where all it is, is www.yourcompany.com.

I mentioned CGI access earlier. I think I went over this completely, but basically, every time you run into a Web form where you fill out something and submit it back to the server, there's a program on the server associated with that. And every one of those programs is pretty much different because they're all custom. And so you want to make sure you have the ability to write those programs with no restrictions.

And a lot of times you'll also want the program in environments that allow you to write those programs in whatever language you want, whether that's C, C++, Tickle, Pearl, Java — a lot of people are going to start writing in that. So the term you'll see is CGI BIN access, because that's the directory that they put the binaries into.

I think the other important thing people want is the logs. You definitely want to see logs of the traffic to your site. And the servers keep this information, so the provider should give you your report, whether it's generated once a month or once a week; actually, you should be able to ask them to give it to you every other Thursday or whatever. And then there are programs to process those logs, and usually the provider will run the program on a monthly basis and send you the report. You might also want direct access to those logs so you can pull that off to your own backup tape, or your own disk, and go through it line by line if you want to, rather than just looking at the summarized report.

Not only that, the servers nowadays — it used to be there was just an access log that recorded every hit; it doesn't record user names, it records what computer on the Internet connected to your system and asked for this page, and at what time and date. You don't know what user connected, so anybody that tells you they're doing demographics of your site — they're guessing. All they know is somebody came from AOL and hit your site. They don't know which user at AOL.

Anyway, you want those logs. But better than that now, the servers nowadays will tell you what page that the user was on when they clicked over to your site, and that's the "referrer" log, because that's the page that referred over to your site. So that's nice to have because then you can find out what links on the Web are pointing over to your place.

M: [inaudible]

Joe Peck: You get the URL of the page they were on.

M: [inaudible]

Joe Peck: Yeah, so that means *Lycos* has it pointed over to your page, so that you would know that yes, somebody went to *Lycos* and searched for me and found me there.

M: [inaudible]

Joe Peck: No, you wouldn't know who it is. You'd have in the other log, your access log, you'd have that they were on this computer, and they clicked over to this page at this time. So you know that they were at some machine at *imb.com* and clicked over to this page. So they are two different logs; one telling what page they were on when they clicked over to your site and one telling what computer they were on when accessing your site, and not just the site but which page.

There's also an error log, which is useful. How many of you know there's an error log on your Web server? And you should look at that, because what that tells you is somebody's trying to get to this page, or this URL, and they're having problems getting to it. Those problems might be that they typed it in wrong, or that the page no longer exists, or it might be that the server is too busy. So that's a good indication you might want to go look for another place to host your site.

[Having the] connection timed out — well, actually, don't be too hard on the providers because "connection timed out" would happen when the user decided to go elsewhere and clicked on the stop button. But that may be an indication that it's taking too long, so take it for what it's worth.

Now, I want to go back into the operation side of it. You definitely want 24/7 operations, 365 days a year, Christmas Eve included. You want people monitoring your server to make sure it's always up, and better than that they shouldn't just be pinging the server to make sure it's reachable on the Internet as a computer, they should be trying to pull off a Web page to make sure the Web server on that computer is working. And so every five minutes we're pulling a Web page off each server to make sure they're still reachable. If some system is not reachable, some Web server is not responding, it generates a trouble ticket automatically and somebody's pager goes off, or he gets e-mail, so there's rapid response. So you want that kind of monitoring of your Web site.

The host should have on-site spare hardware; if a disk fails or a CPU dies they should be able to swap it out if you're paying for that. You should be able to get tape backups on a daily basis. They should be doing backups, and if the disk crashes they should be able to swap it out and restore the system from tape within an hour or two. We've actually had a customer — we just brought up their site, the contract was signed saying, "We'll sign contingent on seeing this restore process take place." So we simulated a crash. They asked for it. It's competitive, right? So there should be power backup, too.

Here's another fun story for you, I've got to tell this one. I was working in Palo Alto. I was working for Digital Equipment running the Internet gateway for that company for a while. And behind the building there — Palo Alto is a nice downtown area. I don't know how many of you have been there, but it's a great place. There are nice restaurants in the area, and in one of the restaurants the deep fryer, the grease bucket, the guy was dumping it out in the alley down the drain hole, only it wasn't a drain hole it was a cover over the — well, all the power lines are sunken underneath the ground, and so there's a power transformer down under there. I swear to God. The thing pretty much filled up with grease over time, and started smoking and smelling, and downtown was down for about three or four hours as they cleaned this transformer bin out. And there were some Web providers in that downtown area that were out, because they didn't have power backup. I actually helped them get up. There was a T-1 circuit and no UPS, no power supply backup. So some restaurant employee took down somebody's site. It's a great story.

You might even want to ask them what's going to be the mean time to repair if a site goes down. What's the response going to be? Is it going to be next day, is it going to be next week? I actually tried to start a Web company and I didn't have 24-hour support, so I didn't take any customers because I knew I was going to Aruba for the week. Actually it was Honduras.

[You need] security, not just for the system itself but also for the upload process. We let people use things like [inaudible] if they want to, so it's a very secure log-in for the upload process. There's nothing to say that you're logging in from anywhere; usually what happens is that you develop your content locally, at your place or at your advertiser, your Web developer or whatever, and then you log in over the Internet to the Web site and do an upload, whether

it's FTP or whether it's Telnet or whatever. If that's in clear text, somebody could be snooping those passwords and they could do an upload process, too. We'll see this; actually we've seen it already, but not at our place.

So how secure is that upload process? They possibly might offer the little hand-held cards that generate one-time passwords, so that even if somebody snoops your password it's only good for one session. Or they might use [inaudible], which is a very secure remote log-in type of thing. So that's important.

I think I'm almost done. The stuff on the server — this is actually what a lot of people are clued in about, or they've heard the buzzwords. So, yes, this is a Web server, but what can it do? Can it do secure transactions with SSL or Secure HTTP, where the MasterCard number is encrypted as it's sent up to the server?

So a lot of people want a secure server. People call up and they say, "Well, is the server secure?" Do you mean does it support these security protocols for transacting with a browser, or do you mean can somebody break into it? There are two standards right now for doing the encryption between the browser, the person running Netscape or Mosaic or whatever; and when they type in the MasterCard number on the form and they say, "Submit," it gets encrypted as it's sent up to the server. And there are two standards for that: Secure Socket Layer, which Netscape developed on their own and dumped on the world; and then Secure HTTP, which went through the Internet standards process. I'm biased, I'll admit.

So anyway, the servers — if you have a site that you want to do transaction processing on or take orders on, it needs to support both because not all the browsers out there are Netscape, and I think it'll be fewer and fewer.

The secure browser in Windows 95 supports Secure HTTP, not SSL, so it doesn't matter. As the Web hosting site you need to support all the standards.

You might want a search engine on your server so you can do the search on the site for this string, or this phrase. And so that might be something like WAIS, Wide Area Index Search, or it might be commercial software from Performance Library System, or Verity, or Open Text or — there's lots of them.

You might want a database that you're going to integrate so people can track their FedEx package. That's the best example. But then your hosting site has to have a database engine on it, and usually that means an SQL, Systems Quarterly Language database engine, like Oracle. So, yes, you can rent space on the server, but is it going to offer all the things you want?

Other stuff on the server might be if people want a conferencing-type system, a bulletin board-type system where other people can post things on the page like restaurant reviews or user comments. And there is software out there that is public domain called *Hypernews*. It turns out that other commercial companies are starting to make their own little nice interface to it, and stuff like that. So is there a conferencing system-type of stuff that's available on the server?

Problem for the providers is, well, everybody wants everything, and it makes it interesting keeping up. So it's nice because I get to keep track of all the nice developments going on in the Web space.

Speaking of Web space — is there VRML on the system, etc.?

The last thing, I think, is the upload process. And the main thing is that people want to it to be easy for when you develop your content. "I don't know UNIX, but I want to transfer the files up. How easy is it?" It depends. There's actually some server software out now that's pretty nice; you develop your content and you click on "Save," and it will copy it up to the server. I haven't checked out how secure that is yet, as to what they're doing. But in most cases you're just using the file transfer protocol to transfer the files over. You have an account on the system, you log into it and transfer the files up. But then you need to log onto the system using

Telnet, a remote log-in, and change your permissions on those files so that they're world-readable so that people can access it. So it's usually a two-step process to do that.

For a lot of people, though, they don't deal with a lot of this. What they do is they hire a Web development company that may be working with the Web hosting service, or it may be that they're doing both, and the user just says they want these pages and the Web developer handles all of it. So I think that's the typical case, because most people don't want to have to deal with this level of detail. So your Web developer needs to be working closely with the Web hosting service, if they're not the same. My take on it — of course I'm biased — is to go with the Web hosting site that has the best infrastructure and is capable of handling the site well, but that same company should be working very closely with the Web development firms. I'd say that's the best combination; but that's just because that's what I do.

Server performance — I mentioned bandwidth overloading. Now there's server overloading where things that are important on the server are basically how fast the server can pull files off the disk and pass it out over the network. And so that boils down to throughput, like buss speeds, I/O bandwidth and CPU speed, and how much RAM there is in the system. If you really want to get technical (I see people leaving), but all computers are not the same. We actually use some old Sun systems that have about 20 times the performance of a nice 486/66 — twenty times the data throughput based on CPU speed and I/O bandwidth, and yet they cost us about \$85 because Sun doesn't even make them any more.

Actually, the thing that people actually ask us a lot is, how many simultaneous hits can this server take? How many of you have measured it that way? Yeah. "I'm going to get a million hits a day; can your server handle it?" What's the distribution over the day? Is it in a one-hour period? So that's determined not just by the CPU and server hardware, but also the server software. You'll see a lot of people on the show floor talking about how they have multi-threaded servers, meaning they can handle more than one process at a time. So my only comment on that — well, two comments: make sure your server is not under-configured for the amount of hits you expect to take; and hey, go UNIX because it's designed for handling multiple connections, and usually the hardware that's designed for a UNIX box has the I/O bandwidth built into it.

I feel like I've been doing this for too long, and I'm not talking to UNIX people any more.

Anyway, the server software is steadily evolving, getting better, and the big thing there is the multi-threading. The thing is, you can get public domain software servers that are free, that run equally as well as the two or three thousand dollar commercial software. So they're adding things like the logging capabilities and the software to help you thumb through the logs easily.

Oh, the last thing, and this is fun — I think it's last because we're running out of time, right? Yeah. Contract issues; when you sign a contract, a couple things to look at are what happens if you want to move your site, how easy is it going to be, what are they going to try to stick you with? So termination process — I saw one provider (this is really, really bad), this one company said, "Well, we're tired of you because you're not providing the support you promised, so we're going to move." This provider changed the passwords for this customer's account so the customer couldn't pull their files off. I don't know what happened with that one.

The other thing to look into is what happens when you need to transfer the domain name. That's a process you'll have to go through, because usually this provider has registered your domain for you and is running the name service for you. You're going to need to move that over to your new provider. But the key thing about getting your own domain name, and using your own domain name, is that it's going to be transparent when you move it. If your domain is www.provider.com/your company and you move to another provider, none of your URLs work any more. None of the places that link to your old URL are going to work because they're still pointing to that provider.com site, and not your own domain. And so all the places

that you've worked so hard to get references in the Web over to your site are no longer any good. So that's why you want your own domain.

So the other thing on the contract is to make sure they put in the contract how easy it is to upgrade, what the costs are and so on.

The other thing on this is the CGI programs. Usually, with the Web developers, you're paying them to develop the programs to search through your real estate database or whatever, so you're paying them to develop these programs to process the information and give the right responses to the customers. And when it comes time to terminate, well, did they develop that for you, or develop that for themselves? Do they own that CGI program, or do you?

For example, this one Web development company was doing software specifically for real estate industry Web sites, specifically for the real estate industry, and so they would search through the database and find, you know, houses based on location and cost range, and type of house and all that. So all these programs were written and the database was written to search through it, and they were doing it because they intended to have several real estate agencies as customers.

I think, though, that the first one paid for most of that development work. So you might want to look at, "Well, if I'm paying for them to develop it, can they sell it then to my competitors? And do I own the program if I move somewhere else? Are those my programs?" So that's something to think about that most people aren't looking at yet. And for most Web developers it's not in the contract, so they're doing it for themselves in a lot of cases.

That's it, yes. A couple pointers — there is the Web FAQ, Frequently Asked Questions. One question that a lot of people ask is, "Well, how can I find an index that places at hosts sites?" If you go to the Web FAQ, there's an entry in there that says, "Can I lease space on a server?" I looked six months ago maybe, and there were 70 companies or so; there's probably 100 or 300 now. So anyway, that's in the FAQ.

INTERNET TECHNICAL ISDN: EQUIPMENT AND INTEROPERABILITY



SPEAKER

Richard Brennan

Technology Manager, AT&T Network Systems

Richard Brennan: Some people still try and call us Western Electric, but that's not going to be our new name. I think the most popular vote is "Undistinguished Symbol, the Company Formerly Known as Western Electric," and so about March when we do an IPO stock offering for this little start-up \$20 billion company we'll have a new name; but meanwhile, my role is to provide ISDN to people who are service providers. The company that I work with directly, because of the area I live in, is Pacific Bell, so some of the examples I'm going to give you are from the other coast — and that's not just because I'm from there, it's because ISDN seems to have done not only very well on the Pacific rim, California included, but it's especially well-tariffed, well available, and well-supported in California. One of the unfortunate things I'm going to tell you is that it may not be true everywhere. California certainly is a state that we would like to get the entire nation to [emulate].

What we're talking about today, in this session — and this is the first of three sessions, and so the sum of the three sessions will constitute essentially an ISDN tutorial — the one we're gonna talk about right now is "ISDN Equipment and Interoperability." So I'm going to do a little bit of an ISDN overview to make sure we're all on the same page, and then we're gonna talk about some of the considerations you might want to consider as you go and decide on an equipment purchase of ISDN equipment to support either your personal use, your organization's use, or — if you're at the other end — setting up a hub or a dial-in site over the public network.

And that is, I think, the unique thing about ISDN — it is the standard for the future. It's the public network, digital-access pathway that's here now. It's here internationally, and it'll be here when everybody's trying to decide whether cable modems are neat and what protocol that ought to be, and whether interactive television is going to deliver the Internet and what protocol that ought to be. And all those things will happen. ISDN is here now, and it is something that's reachable to many locations on the same pair of wires that you have in your home and in your business today.

One of the other major things is that you can't equate ISDN digital technology to the older analog technologies. It was very popular a couple of years back to say "Well, ISDN is going to be exactly 1.7 times as good as an analog line." Well, the answer is it may be just as good, but it [also] may be four times as good, it may be ten times as good, depending on what you're doing with it. If you can't get it to your home or to your business when you want it and where you want it, then it may not be very good at all.

So we're in the midst of all those situations, but I think it is a positive thing that it's becoming more available and more supported by more service providers. You see out on the floor here a large number of ISDN dial-in devices. *MacUser*, this last month, said "Hey, it's what you have to have to get to the Internet." Those are the kind of industry things that are turning this around and making ISDN very viable.

What is it? It is, fundamentally, one of the last things in your home to go digital, and one of the last things in your office. We've had telephone systems around since day one, and that's probably the oldest electronic device any of us were familiar with, the rotary-dial telephone. And it's amazing that the technology for analog telephone lines has lasted as long as it has; you could take one of today's fast modems and plug it in to your grandmother's phone line, and

subject to a few considerations and some noise on that line you could probably make it work. In terms of the analog technology, I don't know of any other technology that basically lasted in its current status for well on to a hundred years... Well, it's time to change that, and the change involves going to pure digital like all these other technologies have gone. So, out with the analog and in with digital; and the fact is we now can get that to you on an individual telephone line basis. The digital means that we are no longer trying to stuff the zeroes and ones out of your computer, out of your TCP/IP application, and down a nice noisy analog line.

We're not converting it to tones, which is all a modem does, and trying to stuff that complex series of tones down an analog line; we are running both voice and data in a single bit stream down a digitally-encoded line which allows for ISDN digital devices, and I do not call them "digital" modems because they have nothing to do with modulation and de-modulation. ISDN digital terminal adapters now can easily run ten times as fast as the normal on-the-street modem technologies, and I think that's the big advantage.

I don't know how many people have raised their hands and said, "No, no. I want the slower technology. I'm having trouble reading that screen as it scrolls past me, so please slow it down." We just don't see that; everybody wants more processing power, more communications speed, and I don't see ISDN being an end [so much as] a point on a path towards broadband communications technology. So we can mix voice and data in one device. We no longer have to have two lines, for instance, to do a voice conversation and a session up to the Internet; we can do that all on one telephone line. At my house that makes the wife and kids happy because the girls want to talk on the telephone to other people. They don't want to be logged on to the Internet all the time, although they do get access from home.

What do we need to support ISDN? Well, you need a telephone company service provider who is willing to sell it to you. That could be either in a business or in a home, but basically the same pair of wires that they put under the street is going to serve ISDN. Subject to some restraints, it's a higher speed digital signal that likes to run over nice, clean copper wires, but it's gonna come in through the wall, through a wall jack just like you have now.

And now we start getting the stack of boxes, some of which we'll talk about — how those stacks of boxes are gonna shrink down and become one box. And you'll see a lot of that out on the trade show floor.

There are three functions here that we need to talk about. ISDN lines need power; they are not powered from the network like your analog telephone is. So, when there's an earthquake in California — or on this coast, I guess, a hurricane — and the power goes out, you are not going to be dialing to the Internet unless you've got a big battery on your laptop, and I question how your PC is running anyhow. That's not what you'd really want to rely on. I would always recommend having an analog line somewhere to use during emergencies, because that line is powered from the telephone central office and will stay up.

You then need a little device called a "network termination," and what that does is take the two-wire interface from the telephone service provider and convert it to a four-wire balance termination.

You then need functionality with a terminal adapter. Terminal adapters replace the functionality of modems in an analog environment, so you no longer use a modem in most cases when you're trying to do digital access through this new network.

In a little more technical diagram, here are the actual reference points in the protocol — and remember, this is internationally standardized. This is not something that was invented, you know, on Route 128. It wasn't something invented in California. It's not something just being supported in those locations; this is an international standard and, in fact, it is being mandated in Europe and in the Pacific Rim for inclusion in public networks.

I'm going to take questions at the end here because I want to get through all the material. I'm going to try and do this real quick, in about half an hour, and then take about 15 minutes of questions at the end.

So we have the local exchange, which is the telephone company switch, the network termination and the terminal adapter. The terminal adapter is used to get back to what we call an R-interface. R-interface is the ISDN's way of describing the older, pre-existing data interfaces [like the] RS-232. All of those interfaces which are not brought under the ISDN umbrella are called R-interfaces.

ISDN lines come in two varieties. There's the U-interface — remember U for universal service — and that's a two-way ISDN line. The NT-1 converts it to the T-interface — remember T for two-pair, and that's not what they stand for, that's just how I remember them — and that's a four-wire interface. And that's what most stand-alone ISDN devices run on today. The T-interface is internationally standardized, and the U-interface is standardized for use here in the United States by the ANSI committee — the ANSI standard U-interface.

What can I run over an ISDN line? Well, the line that's going to be delivered to you as an individual user is called the “basic rate interface.” It's the new digital telephone line; it essentially has user-bandwidth of about 144,000 bits per second, so you can see why I'm getting that number of around ten times the capacity of current in-the-market modems and perhaps five times as fast as the V-fast modem — and remember, it's pure digital, so you don't get that “fax machine effect” where you hit a dirty line and the speed goes down.

This is end-to-end digital, so if you have a connection it's a good connection and you're running those kind of communication protocols. You can then get voice and single-channel data, which I'll here call “point-to-point protocol for Internet applications.” [You can also get] multi-channel data — and we'll talk about multi-length protocol in a few minutes — packet connections, X.25 packet switching is built into ISDN, and also something called “signaling.” You don't access signaling directly, but it's the way you talk to the network and the way the network talks back to you. It says, “I want to call this number in France on voice on one of my channels up there, and at the same time I'm hooking up to my Internet service provider on data on the other channel.” That's how you command the network to do that for you.

Where might you dial to? You could either dial to another basic rate interface or you can dial to a primary rate interface. Primary rate is a T-1, one-and-a-half megabit-type connection. It's not as intelligent as the basic rate interface, but it has more capacity, so that's what Internet service providers, corporate Internet gateways, and educational data centers will use to allow people to dial in and access ISDN services through the network. And once again, it's controlled by a signaling channel, so each one of those channels can be a different kind of a service. They can be a modem service, a digital service, or a packet service on a channel-by-channel basis.

By the way, for those of you who are trying to write all this down on notes, you'll notice that I don't have a lot of bullet items; I prefer the graphics style, and the slides will be both on the CD-ROM, which is available through the conference, and also be up at my Home Page, which is www.image2000.com.

So here's the typical model of an individual user dialing in through an ISDN adapter into a digital network and coming out to some kind of an Internet service provider, and that's usually a kind of a gateway at the service provider serving tens or hundreds of users simultaneously dialed through the network. I'm going to view some of the configurations, and this is important because it gets into what kind of equipment you might want to buy. If you'll look up there, I've characterized these; the first unit here is an ISDN digital telephone set. This is a voice-user who wants to casually access the Internet. They might use the data port in the back of that telephone set to access the Internet, and so they're not really focused on the data

application, they're focused on the very powerful voice interface you can get on ISDN. This is more of an example of an office worker who perhaps wants to move an entire office home and have a very rich voice functionality and also be able to communicate to the Internet or with the office.

The second one is data plus casual voice. Here I've got a PC board in the computer. The PC board is able to offer a richer set of data services, but because it only supports an analog telephone it doesn't have all the button features that you'd want for voice. You've got to decide which it is I'm trying to do here, [either] mostly voice or mostly data. You don't actually have to make those decisions quite as harshly as I've portrayed them here because you can blend some of this together, and we'll talk about that in the next slide. You can put a voice station and a COM port connection through a data voice terminal adapter, or you can go straight with a 10BaseT-type connection out of a NIC board in your computer — or out of the AUI on a Mac — and come right in to a 10BaseT connection in the data adapter. Most of the 10BaseT adapters are supporting two channels of PPP data; that's that multi-link or MP protocol, and that's very important in interoperability between these units.

Now, one of the nice things about ISDN is that the whole linear relationship of a phone line is a phone number connected to a thing called to a phone. That's all gone away; we now have a set of software relationships which means a pair of wires may talk to many devices simultaneously and also may have many telephone numbers and many data services running simultaneously. Actually, at the bottom, the protocol can support up to eight independent devices on ISDN basic rate lines simultaneously. Remember, there are only those three channels, two B channels and a D channel, and you're all bidding for that channel capacity so you may not all be able to work at once. But if, for instance, you wanted to put a video conferencing unit and an Internet access device or LAN access device and a voice phone on the same line, that's very achievable — you just can't use them all to their full capacity all at the same time. Some things you need to be careful about, though, are if you buy a U-interface box and there are a lot of those on the market, if it takes the U-interface directly into the box and does not give you back the T-interface you are locked in to that one device on the line. You cannot add the second through eight devices on the line.

The U-interface does not support the multi-point capability; only the T-interface supports that. So what you have are a number of other options which... There are devices which support both the U and the T-interface. Some devices support a telephone set directly, like an RJ-11 jack out of the back of the terminal adapter. There's a number of variations here. So if you get the unit that has the NT-1 functionality built in, look at the back of the box and see if it gives you back the T-interface out of that NT-1, and that will tell you whether you can add additional devices to the line. Look at the other side and see if it has an RJ-11 voice jack built in. Some have none, some have one, and some have two RJ-11s.

That says that it has a codeck functionality there to convert your analog input, which could be either a telephone or a fax or modem into the digital format running on the line. You cannot run a modem signal directly into an ISDN line without using a terminal adapter — with one exception, which is sort of a spoofing of the protocol, and I'll talk about that in a minute. One of the important things for you to consider is what you are going to be hooked up behind, and so you need to know a little bit about where you're gonna be and what kind of services from the telephone network are available to you.

At a corporate location you may either have connections to an inter-exchange carrier or a local carrier's connections on either BRI, Basic Rate or Primary Rate services. At home or in a small office it's almost always going to be basic rate services, and like all good standards they're great because there are so many variations of them that you can adhere to, so I've just listed [them]. You'll see the terminology "NI" for National ISDN. National ISDN is basically the

Bellcore, which is the agency that is the technology and research group of the seven Bell operating companies working with the industry to define a common set of ISDN signaling commands to let equipment work across all hardware, software, switch and end-point combinations. Before National ISDN was invented in about 1989 there were implementations called pre-national, pre-NI or custom implementations. You need to be aware of what kind of service is available to you and whether the equipment you're buying supports that particular flavor of service. Currently, most equipment has selections for the AT&T [inaudible] the access switch, the NORTEL DMS switch and National ISDN-1. That's the most common combination right now; however, when you're buying equipment you need to look at that list and talk to the service provider in your area or talk to your corporate or your educational network provider and say, "Hey, what kind of service am I going to be putting this behind and what are they going to change it to next year? Are they going to bring it up to NI-2 standards?" That might be important in the next 12 to 18 months.

Once again, just like the selection of hardware, these standards [inaudible] because there are so many ways that you can do a TCP/IP session. They're ranked sort of in order of desirability here, with the first ones being the least desirable. TCP/IP was originally run down some really slow X.25 networks and so it's built for that kind of a reliable network connection; and since the ISDN supports X.25 up to about a 19.2 speed through the network, you can actually get a 64 kilobit packet connection to an end-point. You can run it on X.25. I've done it in our laboratory. It was nice; I made it work and then I threw that away and started working on these other higher-speed connections, because it's not what you really want to do. V.120 is an asynchronous protocol. V.120 asynchronous is the same to ISDN as V.34, V.32 is to the modem world. It is the international standard for asynchronous connectivity on a digital line.

PPP protocol originally was invented for a single protocol stream running between the user and the network. What we get into is that ISDN is built up of many channels, so there are several ways of handling multiple channel calls. They're called "bonding PPP" and "multi-length PPP," or the MP protocol, and the difference is that in bonding the hardware or the application doesn't know about the multiple channels; it sends out one stream, and bonding takes care of breaking up the channels and reassembling them at the other end.

In the multi-length PPP, the communication protocol does understand the multiple channels and so it's aware of channel constraints, and it does the application of breaking up the communication and sending packets down different channels. Here is a little diagram explaining rate adoption. The V.120 standard — remember, your serial port on your computer is running at 38.4 or 19.2 and the channels in the public telephone network are at 56 and 64 kilobits, so that does not match up well and we have to "bit-stuff" all of those COM port speeds up to the 56 or 64 kilobit level to get them to run to the network. There are four different standards for that, three of which are obsolete' they're AT&T, DMI on NORTEL's T-link and the older, international V.110 protocol. The standard that everybody seems to be building in their product now is the V.120 standard. Remember, this applies to async only, but some of the devices you'll see do some async-to-sync conversion in the device, and so you can actually run serial port connections into a terminal adapter.

Here's a diagram showing the difference between the bonding and the multi-link protocol. You can see that in the bonding, the IMUX, the inverse multiplexing capability, is essentially external to the application; whether it's bundled in the same box is irrelevant. It performs a function that your application is not aware of, so your application sends out a single PPP protocol to access the Internet, and this IMUX, as we say, slices and dices the packets up and spreads them over multiple channels and then another matching device at the other end reassembles that.

Bonding is a multi-vendor standard for doing that protocol, and many of the devices you'll see support bonding. Multi-length PPP is perhaps the key interoperability element in ISDN-Internet testing. Under the auspices of the California ISDN user-group there has been a number of interoperability shops done in California, and I'm going to show you the results of that a little bit later. The key thing is to allow multiple vendors, both at the single end-user side, the small LAN hub side, and at the ISDN gateway side to be able to interoperate effectively using this protocol so you can play mix-and-match.

So, a key question to ask — depending on how you're setting this up and whether if you're dealing with an information service provider or Internet service provider — you need to ask them what flavors of equipment they have, and if they handle bonding and if they handle multi-length protocol MP. If they say they're handling that, which equipment types are compatible with the equipment they're using in their gateway? If you're setting up your own network, you need to look at some of the test results. [Bob Lerbo] has written that up for a number of the magazines, and those reprints are available at several of the vendor's booths because they say favorable things about several of the products that are on show here today, including Gandalf, which I know has it, and Ascend also has it in their booth.

So those are a number of the testing things that we need to do to make sure that we can communicate. A bonded call will not talk to an MP protocol call, so you can't hairpin those two communication protocols; they have to be symmetrical and the same, both ends bonded or both ends multi-length protocol.

[Next is] equipment examples. This is just a short list of 30 vendors that we did some testing with, and there really is an authoritative place to go. As soon as I get off the mic here I'm going to go up to Dan Kegel's Home Page at Cal Tech, which is the authoritative ISDN page. Basically, everybody starts there and then starts looking for information. The quickest way to find the URL for it is to go up to *WebCrawler* and put in "Kegel" and "ISDN" on the same line; then just do a *WebCrawler* search and it'll come out as the top item on the *WebCrawler* search.

3Com has taken over the old access work products and added the multi-length protocol to that. Ascend is a pioneer in ISDN terminal adapters and has been there since their work with Haysoft Combac many, many years ago. Cisco has just acquired the CombiNet product, so if you see me not referring to CombiNet's... I think they've snuck into a few of the slides here. Cisco's now acquired the CombiNet product and renamed some of those *CiscoPro*. Farallon has just come out with a new ISDN access device, and I've worked with Farallon on-and-off in vendor relations as they've been developing ISDN gear. Gandalf has some equipment that's just passed that multi-link testing. The IBM *Waverunner* is a good application, and the IBM *Waverunner* uses a DSP instead of the modem "twinsert," a modem-like signal into the voice-bearer capability of ISDN. Modems to the network are voice calls, so a digital call that you may originate over a modem is not the same as a digital-bearer capability through an ISDN network — they cannot talk. The only way you can do that is to actually have a modem chip talking to a codeck chip, which digitizes the signal to do what the *Waverunner* does, which is take a DSP and emulate that process.

The DSP acts as the sum of a modem chip plus a codeck chip and inserts a digital signal that was originated right on the board. KNX is an English vendor with some networking. Motorola *Bit Surfer* is probably the price leader in ISDN connectivity. You can go down to Fry's Electronics in Silicon Valley and buy a Motorola *Bit Surfer* for \$249, and we heard they were gonna have a good price at Christmas time that's lower than that. It raises the question, "If an ISDN device is only \$249.00, given its constraint in this functionality, why would you pay \$350 for a modem?"

The answer is probably because the ISDN service is more expensive and not as universal; but technologically there is no reason why most ISDN devices should cost more than comparable functionality built around modem technology. The industry has just waited for the dynamics of the industry to cause enough demand to make single-chip ISDN solutions, and that's coming to fruition now. We're having single-chip ISDN network interface, a single-chip ISDN processing core, and I think you'll see the numbers basically come down so that an ISDN terminal costs the same as a modem — the same functionality but with five times the speed.

I think that's where we're going to get to in the next eighteen months. So here's the full URL for Dan Kegel if you want to [go to] it directly; then if you also want to look at telephone service providers, you need to start perhaps at bellcore.com or throw in nynex.com or pacbell.com, any of those. Most of those will have a service description of their ISDN services up on the Net, and then you can call and ask about what kind of services are available.

I caution you, many people in many areas make the same mistake of calling up their residential service adviser from their phone company and saying, "Can I get an ISDN line in my home?" And the answer usually comes back, "How do you spell ISDN?" And the problem is that the residential folks in many of the telephone companies are not trained to handle inquiries on ISDN. Pacific Bell, who sold me a residential ISDN line, handles that by a special phone number and a special group that bypasses their normal residential customer service, so they're not geared up yet for those hundreds of account reps to answer things like, "What's the size on your X.25 packet session?" You know, they don't want to deal with that, so they set up a special number.

At Pacific Bell it's 1-800-4-PBISDN, and you call a number like that and they know what you're talking about. They know the equipment and they know where you can get it. They know whether you're behind a DMS or other phone companies that might be behind the [inaudible] switch. They know whether you're national ISDN-I or whether you're a [inaudible] custom, and they can take your order and, in fact, advise you as to what things will work in what combination.

Your business office, however, may be the people to call. If you call a business office and ask for ISDN, and they say, "Oh, by the way, one end of that is going to be at my home," then they are probably going to be able to handle you.

I think I'm at the end with the slides here. Oh, the interoperability testing — CIUG, with the assistance of Pacific Bell and lots of other people, [inaudible] Consulting have put together this interoperability testing, and we've done this a couple of times now. And what this allows is a natural workshop environment with a mixture of DMS and [inaudible] alliance to allow the vendors to go into a lab — usually they've done this at Pacific Bell's headquarters site — and actually do the plug-and-play testing that you need to assure that you can talk to other units. They've tested over 30 devices. The people who like their results are obviously publicizing their participation in that.

Some other people have had to go back to the drawing board and do a little more work, and so you don't see them mentioning that they've been there. You can get some of the details at ciug.org, which is hosted by IBM's Almaden Labs — or at least the service site is. Stan Kluse from Lawrence Livermore National Labs is the chairman of the CIUG, so you can see it's got some very broad industry support. Xerox PARC is also a heavy ISDN site in California. So with PARC, JPL, Lawrence Labs and IBM labs all working on ISDN as users — pure users, not developers — that's the kind of environment we have in California. I have that same kind of service at my home on a single line; I can tell people now that I have the same service that Xerox PARC has, but I've got it at my home. A lot of them do, too.

Let me shift gears here. One last slide. What you need to know about switch types... The MI status. Whether you're an ANSI U-interface or T-interface, if you're behind a PBX you

may be behind a T-interface, or if you're in certain Centrex situations, you may be behind a T-interface. Once you put an NT-1 on a U-line, then you have a T-interface. The most commonly missed item in provisioning an ISDN line is failure to write down the SPID, the "service profile identifier," that somebody told you. In most cases they forgot to tell you because they don't have a form to write it down on — it's, you know, a little post-it note they glue to the back of your telephone.

Actually, they're probably written on the telephone jacks on the wall; that's where I've seen them the most often. The SPID actually controls what services the digital switch sends to your device, because there could be up to eight on the line. Each device has to be uniquely defined to the network, and so without that SPID, you're nowhere.

Now, you may get the answer that a SPID is not required, especially if you're on a AT&T 5ESS line from any of the local service providers or any of the local phone companies. That probably means that you're on a 5E custom ISDN line which does not require a SPID for a single device. With all DMS implementations, all ANI implementations, you'll need to have a SPID, so pound the table until they give you SPID information and make them tell you which directory numbers have which SPIDs and what set of services goes with that SPID. If I had eight devices on the line, each device would have a separate SPID. Some devices can have more than one SPID, so there is no nice, linear relationship here. Everything's under software control, and you need to be informed as to what those services are.

Now we're going to go back and look at a few of these pages. This is where you'll be able to get copies of the presentation: This is our site at image2000.com, and I'll go up here and go to Dan Kegel's page. This is the opening of it, and basically what Dan has here is a set of announcements and lists of equipment. I think he's conservative here; like I said, if they break the \$300 price, Fry's already has them for \$249 and we hear the bits are [going] on special towards Christmas, so you know that starts to become very attractive. If you go into the terminal adapter list here, you'll see long, long lists of corporations — 3Com, Gandalf, IBM, and here's the Motorola. You can see that low price at the bottom there. US Robotics... I thought they made modems, but suddenly [they're into] ISDN. What's that? They're out there. They are all out there.

There's a number of other elements here; as you can go down, you can look under service providers and you can look by type of adapter. Unfortunately, for those of us on the Macintosh, there aren't that many choices of the Euronis — well, they used to be called Euronis. *The Planet Board* is about the only new bus ISDN adapter, unless you're one of the lucky few who got one of Apple's original Apple-made ISDN bulletin boards that, you know, [kind of just] went away. But those are now archival quality.

So most of us use external adapters, and what you'll find is that those work with anything... Motorola, to my knowledge, didn't have a booth here, but most of these other vendors are represented on the floor and I encourage you to go and sample the spec sheets on all those and make a decision.

Just a little war story... I ordered my ISDN line for home at the Internet World [Conference in] San Jose, in May. The following Friday they called me up, and we negotiated SPID information. Two weeks, a week from the following Tuesday, they were out in my front yard cutting a four-foot square hole in the sidewalk to pull the extra pair in. Previously I had three analog lines, but those are assigned to my wife and my two daughters, so I didn't have one; now I have digital so I can now access the Internet from home. That was in California, [and there was a] \$37 installation fee and \$25 a month.

So now I'll accept the tears and jeers of the crowd here. There's a question from right there.

M: [inaudible]

Richard Brennan: Bank teller machines? Oh, I'm sorry, the other ATM. Let's see; ATM to your home today, would be what? \$3,000 a month, a \$1,500 interface adapter, \$29.99 a month and — you know, I'm actually working in the group that's providing the hybrid-fiber coaxial network to Pacific Bell which will deliver those types of services to three million homes in Northern California over the remainder of the decade here. By the year 2000 three million homes will have the capacity to provide that kind of — think of an ATM 25 network in your home, plus video conferencing, plus interactive television — you know, all the stuff you wanted. The capacity and the network is there, but that's a little project valued in the \$5 to \$12 billion range and it's not going to happen in, as you said, three months or six months. There is essentially no way to cost effectively get large volumes of — and I'll stress this — symmetrical ATM service to your home. There will be people who are proposing some one-way technologies that say they'll deliver you high-bandwidth, and that may work well for certain kinds of Internet view-only applications but it certainly doesn't work for a telecommuting application, something where you want to be peer-to-peer.

An emerging trend in data communications is going to be data collaboration. [ATM] will not work as well for that, and it certainly does not work at all for things like video conferencing, so asymmetrical ATM will be achievable perhaps in two or three years. Symmetrical ATM is going to wait three to five years and still be expensive.

M: [inaudible]

Richard Brennan: Yeah, that was a couple million lines of user-interface code behind the BRI because it was intended to point at a user. So what is the call-forward, busy, don't-answer-on-data feature for PRI? Those kind of things don't exist for BR either, but call-hold, call-transfer, drop — all those things are understood by a basic rate interface. PRIs have trouble with some of those concepts; they don't know what feature buttons are in the voice environment, and they may not have the same richness of data control functionality that a BRI has. It's all in the user interface and mostly on voice.

M: [inaudible]

Richard Brennan: Well, I miss it because I think in certain areas you can get it at home now.

M: [inaudible]

Richard Brennan: Oh, mobile? So you're talking about cellular and wireless technologies, right? People are gearing up. Some of the PBX's now might call Northern AT&T [and see what they] can handle, to make sure of BRI and PRI services. Wireless is an interesting one. Everybody says, "Why are you doing this? We'll just go wireless." You either hear of them doing broadband LANs for tens of users or tens of megabits for several users; you don't hear them talking multimedia broadband for hundreds of thousands of wireless users, and that's what you need to do whole communities on broadband wireless.

Broadband wireless is a reality. There will be things like MMDS, which is one-way television service, asymmetrical. You can't talk back very well, so doing multimedia and receiving things like interactive television are two very different applications. In the press release wars they tend to get blended together and talked about as if they are the same thing.

The question I always ask is “Can I talk back?” You can do MPEG, too, in your home. Can I talk back? No. So that’s the question, how much you want to talk back. Otherwise, downstream-type services from satellite, from terrestrial wireless, and from cable modems and things like that are very achievable and will result in some great services at very low costs. More questions? Yes.

M: Do you know of any [vendors] who are providing [inaudible] with the ISDN?

Richard Brennan: Yes, there are several, both at the local side and at the host side. I believe that, yes, Robotics has that. I believe that Gandalf has a model that supports that — and the other vendors are probably going to throw rocks at me because I’ve forgotten who they are, but certainly they do exist. The IBM *Waverunner* does it with a DSP. So there are good examples of products which imbed either the modem or the DSP functionality inside the ISDN device to act as if it was a fax modem or regular modem.

The Cisco *ComNet* boxes and the Ascend boxes support that with an RJ-11 jack in the back of the ISDN internal adapter, and they do it with brute force. They throw a codeck chip at the analog signal right there and digitize that signal for the network. Question?

M: FCC and ISDN?

Richard Brennan: Oh, how many calcs do you want on your ISDN line? No comment. I think that will be decided much in our favor. Frankly, the calc is the charge that was put on the telephone line to pay for things like universal service, and somebody in FCC decided, “Well gee, if the ISDN line can support two B channels, that’s like two telephones, so there should be two calcs.” I think that’s a very linear interpretation of the program.

M: What about the [inaudible]?

Richard Brennan: Good question. They didn’t say eight calcs, they said two. It’s like, “So where do you go?” You know, the questions are, “What should it be? And how many addresses were on there? Were there 128 phone numbers on those two devices, or just one? Where’s the value there?”

So there’s a whole conceptual question that I don’t think was addressed by the FCC, and I think everybody was collectively throwing rocks. You can read the “Comp Decom ISDN Newsgroup” and get a lot of the thread of that conversation. [There’s] also some additional words on the CIUG organizational postings, and also at Bellcore. No more questions?

M: [inaudible]

Richard Brennan: That’s Ascend’s proprietary implementation extension of MP. They have announced that they will make that protocol available to the industry, and hope to get a consortium to lobby for that as being the further extension of the MP protocol, which is RFC-1717.

M: My supervisor at USWest just filed for [inaudible].

Richard Brennan: Remember, I speak for the equipment manufacturing side of AT&T, not the service provider side of AT&T, so separate that right now. ISDN is not cheap to provision to the user, and I think people, now that we are starting to address the “how do we get to the

users” question, then somebody up at the CFO office says, “Now, how do you make money doing this to user?” So there are some people taking a look at the value equation in ISDN. What is it worth to people if it can support five times the speed and eight devices? What’s the value proposition there?

I don’t know that you’d have to just do a knee-jerk reaction to tripling the price, although somehow that doesn’t really seem right. You have to look at the set of services. Is it measured rate? Is it flat rate? How much are they charging you to install it? How much does that bring the per monthly charge to? In Pacific Bell, they said it was \$37 to install, \$25 a month and they waive, I think, the \$150 installation fee if I keep the service for two years. Now, that is about as cheap as anybody has tried to provide the service. Can Pacific Bell keep going down that road? I don’t know how long that will be possible, but certainly that’s the best in class right now for ISDN service. Yes.

M: Do you think the [inaudible] of whether a serial parallel [port].

Richard Brennan: [Inaudible] of serial ports are way beyond their technological life. You know, to call RS-232C a standard is somehow an oxymoron... I currently like the 10BaseT solutions because I think they’re more flexible. I have both a Mac and a Windows machine in my home, and I can hook both up simultaneously; then my daughter can spool her laser printer jobs from the bedroom out to the laser printer in the front room. That’s how my house is wired and so it’s device-independent.

I think as we go to things like ISO Ethernet — which is 96 B channels, plus D channel plus Ethernet — as we go to other protocols, I think that for the distribution around home and business, the next generation of LAN interfaces will continue to predominate; however, if you’re doing a real office with knowledge workers who are on the telephone a lot, if you need that to run a home office, the idea of running one of those devices directly off the phone network and having a robust voice service there and then — perhaps doing separately to get a data service — seems to have a lot of merit. Even in the most “propeller beanie-type labs” you find telephones next to the computers that are in the lab, because anybody who’s having to do maintenance on those computers or remote diagnostics or work with the user at the other end has to talk on the telephone.

So you need telephone access if you’re using a computer for anything that’s in the business world. And I think that’s what’s driving those, too; they will come together so that the phone is part of a computer. The telephone, as a device, is going to go away; the telephone becomes a hardware-software application capability inside your desktop.

I think that will go away from the serial ports. There is a new generation of high-speed serial ports coming out, [inaudible] and Firewire which allow things like that to be done more effectively. But right now, because of costs, I think 10BaseT has sort of been the leader.

I’ll keep going because I’m the next two speakers, so I can use my own time up. By the way, if you do want to stick around, what you’ll suffer through is about a 10-minute review of what we just said here, followed by a discussion of service provider issues, and the third session will be how to do it from home. So I’d like to thank you for your participation, and if you have any questions, I’ll keep taking them here. We’ll just keep going, but meanwhile we can bring up the lights and let people go on.

INTERNET TECHNICAL ISDN: SERVICE PROVIDERS



SPEAKER

Richard Brennan

Technology Manager, AT&T Network Systems

Richard Brennan: This is the session on ISDN access to the Internet, focusing on Internet service providers. What I'm going to do today is take a rather broad interpretation of what an Internet service provider is going to be.

My name is Richard Brennan. I'm with AT&T Network Systems. That used to be our name; I can't tell you what our name is going to be in March, so we're referring to ourselves as the "no name" company because we're one of the companies that are going to be spun off from corporate AT&T. We're going to be a nice little 20-billion dollar start-up company in March, and we will have everybody with a factory with AT&T come into our side of the company. So if it's made in the factory, we've got it.

Currently, I support the applications that AT&T is partnering with Pacific Bell for providing in California, so I do have a bit of a West Coast bias. But I will hopefully get over that and talk about things in general, and how they work in other regions of the country and, in some cases, how they don't work very well in other regions of the country. You can send me e-mail.

These slides — I don't have handouts for you — but the slides will be both on the CD-ROM and available up on the Net, hopefully by Monday, at www.image2000.com, which is our Home Page in San Ramon, California. They will be in gift format there, so you can pull them down as individual images and take them off the network.

What we're going to do is go through the presentation and then do questions at the end, so I hope to do about a half an hour of direct presentation and then take about 15 or 20 minutes worth of questions. We aren't really bounded on time, since I'm the next speaker also, so I can use up a little of my own time there.

What we're going to do is review ISDN and talk about the ISDN Internet providers and long distance phone companies. Just to review: ISDN is the new digital protocol, a new digital telephone line. It runs on the same copper pair that ran under the streets to get to your place of business, or your classroom, or to your home, but it is a pure digital protocol coming from the network that supports a multitude of services. It's internationally standardized, and it's really well-supported by the vendor community.

I think you should go out on the floor here and start looking around at the booths supporting dial-in connectivity. There are almost as many or more booths showing ISDN dial-in as there are showing modem dial-in. I mean, this has gotten to the point where ISDN is becoming the preferred mechanism for dialing up to the Internet.

Mac User magazine had a little bulletin, on the lower right-hand corner of the cover on this last issue, that said, basically, that ISDN is what you need to get onto the Internet. What you need in order to provide a link to an Internet service provider is a place where you can connect up.

Now, whether you're an individual user or an Internet service provider, the elements are the same: you need a connection to the ISDN Public Network, which is the global digital network; you need power — ISDN devices are not powered from telecommunications switches, so they will need local power; you need a function called a network termination; and you need a functionality called a terminal adapter. This will vary greatly, depending upon whether you're the individual user or small LAN site of an ISDN connection or whether you're the service provider site, but we'll get into that detail here as we go forward.

The ISDN's basic rate is basically the unit of ISDN. It's the set of channels that are derived off of this new digital connection. There are not three wires in an ISDN connection — there are three channels' worth of communications derived out of that same pair of wires. They used to run your old analog telephone, but now we can run a total of about 144,000 bits per second on the single connection to your home.

What we're going to do is aggregate those up into a primary rate interface for service providers, so that many people originating from basic rate connections can dial in to a service provider — and that could be a commercial service provider, corporate, or educational service provider — and get access to a gateway that provides them Internet access.

That's usually done over the primary rate interface — the initial increment of which is 23 B plus D, so 23 B channels, 64 KB channels, and one D channel, which controls what goes on in all the rest of the channels. In both the basic rate, BRI, and the primary rate, PRI, it's the D channel that tells us what kind of service is coming over that network connection. As you see here, on the primary rate I can have voice or modem connections.

By the way, to the digital network a modem call, even though it's data, is considered a voice-grade connection because it's carried as a series of tones over the network, not as zeroes and ones. When I say data, I mean pure zeroes and ones going through the network, like we would get from a PPP or a multi-link PPP connection, which we talked about just in the last session. We talked about equipment and interoperability.

If I want more capacity than that single PRI can provide, I then start stacking up those T-1 pipes, each one of which has a total of 24 channels in it, so 1 1/2 megabits at a time, I'm starting to stack up bandwidth. Ultimately, I get what's called an NFAS (Non-Facility-Associated Signaling) PRI. What that means is that there are then facilities or T-1s in my network coming to me as a service provider that don't have a signaling connection, don't have the green pipe, which is the D channel signaling information in the same T-1 as the calls are running. So the first T-1 will always have a D channel, and then we'll have 23 B channels.

After that, I can add more B channels — 24 at a time — without adding another signaling channel, up to some maximum of usually in the hundreds of channels that I could then run in to a point of service and provide connectivity.

Now at some point, I may say, well, that's an awful lot of communications to be running dependent on the continuous operation of that single D channel, so to provide an additionally reliable connection, I am going to put a backup D channel on the last PRI. So any PRI from the second to the nth PRI, or T-1 facility, could have this backup D channel.

So I've got two things: I've got the non-facility associated signaling, which means some of the PRIs don't have their own D channel in them; and I've got the backup D channel. That's the set of services that most of the Internet service providers build; and if you look at their literature, a lot of them handle numbers like four or eight PRIs, and what they mean is they handle four or eight T-1 facilities and then they can usually accommodate either facilities with or without a D channel.

They may choose to just go ahead and order four T-1s like the first one — each T-1 having its own D channel, that's an allowable configuration — but that means there are four independent facilities and they have nothing to do with each other. Or they could order four like we've shown here, with the middle two PRIs being the way I've shown T-1 number two here. So I'd have one with a first D channel, two with no D channels, and the last one I could optionally have a backup D channel.

That would be a very effective way of then building a service from the public network to your telecommuting hub if you're a corporation, to your student access hub if you're an educational institution, or to your dialable gateway if you're an Internet service provider.

If you look at the way PRIs are connected, they're connected from digital telecommunications switches. They originate just like a telephone line did except they're much larger-capacity. They run through — in the voice applications, they tended to run through PBXs to provide individual user connections behind either proprietary protocols or analog protocols or the ISDN BRI.

Now, some PBXs will support a PRI hub behind the PBX, so you might be able — if you are an educational or a commercial user you could put a PRI-connected dialable hub behind your PBX, and then you can share bandwidth with the voice calls that are running into your PBX. The reason this is good is because during the day you'll probably have more voice communications running into your PBX than data; during the evening, when people are trying to telecommute in, you might have more data connections than voice, and you might have no voice if there's nobody at work. So you could essentially spread that usage across the same PRI facility by essentially hiding your gateway behind the PRI. You can't do both at the same time in the same quantities because you're limited by the total number of channels you put into the PRI.

A more common service arrangement for an Internet service provider is to procure PRIs directly from a carrier — and that could either be from an exchange carrier, or a local exchange carrier, or an alternate access provider — and then they would hook up their connections using dialable phone numbers, directory numbers into the network. Anybody who wanted to access that service then would dial the directory number they gave you and get into their bridge or router from off the network.

Typical switches would include the AT&T 4-ESS and 5-ESS switches, and the NORTEL DMS. The switches might include Siemens' and Ericsson's, which you might find in the American network.

So this is the model that essentially we end up with: individual users dialing through an ISDN network, and the individual users have some kind of device, an ISDN terminal adapter, and they're dialing into the network and they're going to hit some kind of an access gateway box that is then connected to the network; the network there is then gatewayed to the Internet service and the Internet itself, usually through a very high-speed connection, typically at least a T-1 and often a DSP or 45 megabit-type connection.

Very commonly, the connection up from the network gateway to the Internet itself will be run as a frame-relay connection, which is a little bit more efficient than ISDN for dedicated connections. ISDN has the advantage that it is a dialable connection and can be routed essentially from anyplace that has a digital network capability. That includes most local phone companies; most of the digital PBX providers can upgrade their PBXs, and all the international carriers and international service providers are doing ISDN. In fact, in America we sort of lag behind the implementations in Europe and the Pacific Rim because we don't have directed policy telling people when they should do ISDN.

An important consideration in handling large numbers of channels is that PPP protocol, the protocol that's most commonly used for a synchronous network connection dialing up to the Internet. It was originally architected to run over one channel. And you just saw that the ISDN, the basic rate and the primary rate are built up of lots of littler channels.

So an issue is, "How can I take advantage of those multiple channels to do my Internet access connection?" Well, TCP/IP has an RC written here — the engineering task force — that's been widely adopted throughout the industry, and that's RC-1717, which provides a new protocol called MP protocol, multi-link PPP protocol. That protocol then allows multiple channels to be connected to a single TCP/IP session.

There's another, older method of doing that called "bonding." The difference between the two is that bonding uses a functionality called an IMUX, or an "inverse multiplexer," which

is essentially electrically-adjunctive and separate from the TCP/IP application. So the TCP/IP application sends one PPP stream out towards the network, and the IMUX does what we like to call slicing and dicing — it slices up that big PPP set of packets into smaller chunks, sends that over multiple channels, and reassembles them at the other end.

MP, however, understands that the network has channels and is an extension to the PPP protocol which understands channels directly in your application or in your gateway. Those two cannot talk directly to each other; you can't originate a call on bonding, and terminate it on MP. However, many of the boxes that do bonding also do MP, so sometimes you can have your cake and eat it, too. You just need to both agree whether you're using bonding for a multiple-channel call or MP for a multiple-channel call.

That's the kind of question that, as a service provider or when you're negotiating with a service provider, you need to ask. Which kinds of protocols are you supporting for connections with more than one channel? And you'll get different answers depending on the service offering. That's why you see pricing variations for single 56 or 64KB connections, dual-channel connections and multiple-channel connections. There are some boxes which support bonding but do not support multi-link protocol.

We'll show a few examples here of service providers. This is just an example of how I do my access in California; InterNex*Tiara is a commercial Internet service provider, and they've established point of presence in my local area. They're not in the same town I'm in — they're down the road a ways — but they are reachable on a dial-up connection through Pacific Bell's network, so I dial from a workstation. At various times I've used the Ascend pipeline devices, I've used the CombiNet, which is what I currently have in my home, and I've used AT&T telephones to do that. We dial through the ISDN network, and that terminates, in their case, on an Ascend Max hub.

Those are the kind of equipment combinations that you'd end up building a network with to support anything from four to 400 users. If it was a four-user network I might put something small like an Ascend 400 hub, which supports a four [inaudible] line, eight channels worth of capacity, up to the Max hubs which support four T-1s worth of capacity.

Gandalf, Network Express, [Teleosis], CombiNet, Cisco — those vendors will have other products which do very much the same kinds of functionality. You can mix and match — you don't always have to pick the same kind of hardware at the user end that you have at the ISP end. What you have to do is, once again, check that set for compatibility. Are we running bonding? Are we running multi-link PPP? Are we running Ascend's MP Plus protocol? What is the set of connections that, number one, I'm trying to make, and number two, that's offered to me by this combination of equipment?

One of the interesting ways of using the telephone network to build a service like that is to build a so-called "Internet centrex." This is built around the fact that in a telephone service a centrex was defined as a set of telephone terminations that could talk to each other without incurring any message units.

Now, back in about 1962, when this was originally designed, people had it in their minds [to have] a whole bunch of people sitting behind analog telephones in a single building, talking to each other in an intercom kind of a style. If you go forward about 35 years the connections are now digital, and in some locations they forgot to write into the tariff that they all had to be at the same address, so you have a combination of circumstances which lets a service provider go to a single digital wire center that's running ISDN and say, "I'm going to create a service called an Internet centrex. I'm going to buy centrex service from the local telephone company." In California it would be Pacific Bell.

[Then they would say], "I'm going to buy centrex, and I'm going to sell a service out of that centrex that is the combination of a centrex service and Internet access service. So I

become a centrex re-seller, and when you buy service from me I arrange for the line to be hooked into your home. The telephone company bills me, and I bill you for the sum of your Internet access and your telephone access off of that connection.”

Well, what’s nice about it is there are no usage charges from the telephone company for any of the connections within that centrex. So if I’m dialing from a home location into the gateway, and I’m on the centrex — or from a small business into that gateway — there are no usage charges. If I’m in the same building, obviously there are no usage charges. However, if I’m outside the centrex I can still subscribe to this commercial service, but now the telephone company is going to charge me measured units most of the time and then I’m not getting my phone line through the Internet service provider.

So you can sort of play several games here at once, but this is one way of getting around the idea of having to pay from one to four cents a minute for your connectivity time to the phone company, as well as whatever you’ve contracted for your connectivity time from your Internet service provider. So everybody wants their penny here, and what we’re trying to do is optimize the set of services to accommodate that.

When I’m building access it does make a difference [in terms of] the sort of service I want, and some of the issues are around security. One of the people that I’ve worked with works for a large petrochemical engineering concern, and they were concerned about putting fully routed connections into their telecommuting network. Their concern was this: I have a device that has two B channels for data; I can dial those two B channels in different directions, one of them up to my corporate telecommuting LAN-access gateway, one of them off to somebody who I didn’t really want to have get access there, and without a lot of problem, I might be able to route between them.

That was viewed as being not necessarily the greatest thing in the world for corporate security, so some of them have preferred to use filtering bridges to set up those kinds of telecommuting gateways. Now, what you can do is — you’re not, once again, limited to only bridge connections or only routed connections. Generally, a lot of the hub gateway devices can handle either type of service, so there are performance characteristics that come with each kind of connection. And those are the kinds of things that you either want to discuss with the gateway hardware manufacturers, if you’re setting up the service, or with your ISP if you’re buying the service. Depending on whether you’re getting a route connection or bridge connection, you may get a different cost point and a different utilization factor off of that network.

One of the interesting things is that just because I have a digital connection to my network, it doesn’t mean that all of the calls have to be coming on digital paths. Some of the equipment can handle incoming calls that are sourced both from digital endpoints, like ISDN terminal adapters, and analog endpoints — I think they use something called a modem to do that.

Some of the digital endpoints with only digital conductivity can handle both your incoming modem traffic and your incoming digital ISDN traffic. This gives you really clean data-center installation because I don’t have to have one massive rack of modem pool equipment and another rack of digital access equipment. I can compress that down, only have digital access, get some integrated network management tools running here, and have all of my commuters dial the same set of numbers, no matter which capability — voice, which is modem traffic, or data which is PPP traffic — is coming into my data center.

It’s a very clean installation, and one that really makes telecommuting work nicely because I don’t have to change my published numbers; people can change from modems to ISDN at home and still dial into the same location. So it becomes a sort of a unifying part of a telecommuting or remote-access strategy to be able to do this.

M: [inaudible]

Richard Brennan: Well, it looks at the incoming call and says, "Is this incoming call a voice-bearer capability or a data-bearer capability?" If this is a voice-bearer capability, I know what that is — nobody's calling me expecting a phone here, this a modem call. Modem calls are voice-bearer capabilities; modems convert the zeroes and ones of your computer into tones running in a voice-bearer capability.

If the next call comes in and it's a data-bearer capability, it says, "I know what that is, that's going to be a PPP call," so it terminates that and then it negotiates protocol. Then it says, "Is this a single-channel PPP call or is this a multi-channel PPP call?" and it should be finding out if there are some other channels dialing me that are going to be associated with the same session. The gateway products can do all of that intelligence and unify that. Some of them do it with DSP technology; some of them do it with brute force with modem chips in the gateway, but you're getting the same functionality.

With local exchange companies, don't just count on the fact that if you're in one of the seven larger Bell regional holding companies that those are the only people that have ISDN. Both Rochester Tel, up in New York, and places like the [Roseville] Telephone company in California are very much in the forefront of ISDN deployment. So a lot of the small independent companies also have been doing some ISDN.

There are some of the smaller independent companies that have really gone gangbusters on making ISDN available. Pacific Bell — not just because I live there, but I think it's fairly well recognized that Pacific Bell has one of the better sets of service offerings both from price standpoint and from availability standpoint, perhaps not only around the country but perhaps around the world.

[I want to discuss] what you're going to get from your telephone service provider. Really, you're starting a stack of things here: I need an ISP — an Internet service provider — and they're going to have to have connections to a public network; I'm going to have to get connections to a public network; and if I'm not located in that carrier's area, I'm going to have to get connections to a long distance network. So we're going to go through the whole set of services here.

You need a U interface and a 2R interface coming in from the network. This is the protocol that now allows the ISDN line to terminate. This is where the term [2B12] U interface comes from — two binary information elements and one [inaudible] or four-level signal. This is the ASCII standard. So that 2R interface is what replaces the analog pair of wires that was running the tone-based signal to your home.

What you get into is a distance limitation, which says that if the telephone company cannot get service to you within, say, 15,000 to 18,000 feet, they're going to have to add electronics on the line to get that signal to you. So this constrains your ability to be a service provider in some cases, because some phone companies bill you extra for making those lines reach.

Pacific Bell has a policy that they will provide the electronics; they averaged it into their tariff cost so they will provide extra electronics. You see at the bottom, for getting past that arc, it says that's where I can serve from the central office switch.

So if you hear of people being in ISDN blackout areas, it's for one of two reasons: either the central office switch has not been upgraded to provide ISDN capabilities, which is "a billion dollars here, a billion dollars there" kind of project in California, or your copper wire is running too far under the street for that service to be able to reach you.

There is a — anybody who quotes footage on ISDN is lying to you — there is a 42 dB of gain/loss budget on the pair, and it doesn't like being tapped; so the answer is that it always depends on what your copper looks like, as to how far the ISDN can go. A reasonable engineering guess is 15,000 to 18,000 feet; after that, if you live up in the hills, down the road, or around the canyon you're not going to be able to get an ISDN line without some extra electronics. And in some service areas, they will bill you for that extra electronics, and it could be as much as \$1,200 a line.

The T interface is a very short interface — it's what most ISDN PBXs provide. It's a four-wire short interface, and it's what most equipment is built to because it's a very international standard. Only in America do we see a large number of devices with the built-in two-wire U interface standard. Most other countries, because of regulatory differences, have the NT-1, or two-wire to four-wire conversion provided by the phone company.

We in America had to be different so we said, "That's customer equipment, and we let you pay for it, buy it and install it yourself." So the T interface is the four interface. Remember this: T for two pair, that's what most of the devices will be running. If you heard the equipment session earlier, it does make a difference if your device has a U interface on it but does not give you back a T interface — that is the only device that can be on the ISDN line.

If you're looking at the back of the box, it takes U interface and also gives you T interface out. That means you can add extra devices on an ISDN line. If you have a stand-alone NT-1 that takes U in and gives T out you can have up to eight devices on the line, depending on the switch implementation.

Here are the variations you're going to need to ask your telephone company about. From the PRI you will be connected, in most cases, to either an AT&T or NORTEL switch. I think there are also some Siemens and Ericsson switches in the public network. For basic rate, it'll mostly be the same — AT&T and NORTEL.

Then there's national ISDN. National ISDN is an attempt to standardize the switch-to-user equipment interface across all manufacturers of computer hardware, and all the switch types. The first version of that is called National ISDN 1, and it came out in late 1992. It is just now being widely deployed.

One of the problems in the phone industry is how to rewire 20 million homes and several hundred million phone lines. It takes a while — and a few billion dollars. So we're just getting into the NI-1 time-frame. Most local exchange companies are now either provisioning NI-1, or customized ISDN, depending on the switch type to your users and to your implementations.

You need to know which it is. You need to know which kind of equipment you're buying and whether it supports NI or custom or both. NI-2 is being loaded into the switches right now, and service providers will start adding that to their offerings when it becomes readily provisionable.

Then there's NI-3, and they're renaming them NI-95, NI-96, and NI-97. So, like all good standards, they keep changing, so they keep engineers employed.

[There are some] must-know parameters. You need to know your customer NI; you need to know your switch type; you need to know what kind of service you're getting; and you need to know, on a basic rate, what kind of SPID, or "service profile identifier," and [the SPID] is an absolute mandatory element that you must demand of your telephone service provider.

From the interface service provider, all you probably need to know was the IP address range that you're getting from your service; what kind of protocol they're accepting; and [whether it's] PPP or multi-link or bonding. But these all go together to say that in order to dial a complete connection, I have to know all of those things.

Then, of course, what happens if my Internet service provider and my user are not located in the same service area? I need to dial long distance, and that brings up a whole other set of issues. It says here's what the network really looks like. There are really three networks involved here: there's the 56/64 KB network, which is where our voice calls currently run; there's the X.25/X.75 packet network; and there's something called the SS7 signaling network. Those networks all need to be connected up between carriers if your call is going to go from one carrier to the other carrier and come back down to a user.

In fact, they need to be connected correctly within your carrier's own network in order for you to gateway between different switches in a single carrier's network. People are just now starting to get Signaling 7 conductivity, and what we call "64-clear," [which is] the ability to run at 64,000 bits per second instead of running at 56,000 bits per second. 56,000 bits per second is what the old voice network has run at for a long time, since they first started putting digital equipment in the network.

In order to get the full bandwidth of ISDN we have to change to Signaling 7, and do a lot of changes in the network to open that capacity up.

If we are running packet mode — which is not wise to use for TCP/IP, although that's really where it originated — you need to have a packet gateway to your packet carrier that supports a relatively high-bandwidth connection.

When you look at the service providers, each one of these service providers has to buy connections from the local exchange carriers and then put in the necessary facilities — 56 or 64KB facilities — and the Signaling 7 gateway connections to be able to handle your calls. So just because one carrier has a 64KB connection to your telephone switch that your local phone company has in your town does not mean that the other two have the same connections; it is very possible that they have not yet implemented in 64 KB, but they might be implemented in 56 KB.

We do a lot in testing here by trying the calls, first using one carrier, then using another carrier, then dropping back to 56 KB and trying it again, and eventually the call will generally get through from most exchanges in the United States. There's some digital connectivity in almost every local exchange.

With international — they've been running at 64 for a long time; they can't figure out why we're still so hung up on 56 KB.

Another issue is, who can talk to whom? If I originate on a voice-bearer capability — I don't care what kind of switch it is, we all know that no matter what kind of network I'm on I can talk to somebody else on a voice-bearer capability. So if I originate voice, it can go to voice behind any analog or digital exchange — it doesn't make any difference. We know that works.

If I originate in a 56KB data mode, that's where we have the most connectivity right now in the United States. I can terminate to a 56KB data mode whether or not it was ISDN. There are older switch 56 connections — switch 56 and some DDS-type services, and some two-wire switch 56 connections that were proprietary — but I can terminate to those, one channel at a time. Remember: ISDN has two B channels, or bearer channels, while those 56KB services only have one channel.

Now, what's interesting is that I can also connect to somebody who's running a 64KB connection in what's called "restricted mode;" so if I originate in 56KB mode, I can talk to somebody else who has a 64KB connection. But if I have 64KB connection that I originate at 64KB, I can't always talk to somebody who has only a 56KB connection; I have to change my call origination down to a 56KB bearer capability, which is possible.

When I have ISDN I can either choose 64 or 56KB to originate my call. If I originate at 64KB, the bottom line there, I can only terminate when the entire network — from the local exchange up to the access tandems to the point of presence for the exchange carriers, the long

distance carriers, all the way through their network and all the way to an international gateway, then all the way to the other side — that's all got to be 64-clear in order to make a successful 64KB call.

To make a 56KB call I just need a data-grade pathway through all those connections; and those might not be Signaling 7, they might not be ISDN, but they'll all be digital. So there's a much higher likelihood of connectivity in the United States.

A lot of us who do this just leave our equipment at 56 and don't worry about the last 8K. As a [inaudible], it's not worth worrying about, because the speed I'm getting then in comparison to modem speeds is so beneficial that I don't worry about trying to get that last 8K out of the network connection.

M: [inaudible]

Richard Brennan: It knows what bearer capabilities connect to what. The network knows that; it knows what facilities a 64KB call can transit, what facilities a 56KB data-bearer capability can transit, and what facilities an analog voice-bearer capability can transit. In Signaling 7, in pure implementation, all of those bearer capabilities can run down the same network. In Signaling 7 the network doesn't care what kind of connection you have; it's where we don't have a full Signaling 7, 64-clear environment that you have to worry about this. Now what this does is this constrains how you can get access to an Internet service provider, and over what distances, and at what speeds.

If you want to get to some very good starting points and pointers on this, I highly recommend the authoritative ISDN Home Page, which is Dan Kegel's Home Page at Cal Tech. The service providers — you can go to [inaudible], or you can go to att.com, and mci.com, sprint.com, for their services.

I'm just going to shift gears here and show you a little bit of what Dan's Page looks like. The quickest way to find Dan Kegel's Home Page is to go up to WebCrawler, put in "Kegel," and space, and then "ISDN," and it'll come out as the top thing on the list. This really has the largest centralized gathering of information.

[I also want to mention] new information about engines and terminal adapters — they're breaking the \$300 price barrier. In fact, I believe that's very conservative — one model of the Motorola *BitSURFR* is already priced at \$249 at Fry's Electronics store in California, and there's rumblings that there will be a Christmas special with an even lower price than that. So TAs don't have to cost any different than modem technology, given that they typically run five times as fast.

If you go into the ISDN hardware side of Dan's pages — they assured me this was a fast connection — it must be popular right now — what you find is perhaps a much larger list than you might have expected for hardware providers. Many of those hardware providers are also gateway hardware providers. Look at the large system providers. Cisco, as you may know, just acquired CombiNet, so Cisco and CombiNet are working together and those products have been renamed the Cisco *Pro ICM* devices. AccessWorks was bought by 3Com, so 3Com is marketing the AccessWorks boxes. Ascend, I believe, provides both hub and individual user devices across a large range of sizes.

So here's this long grocery list. Why don't we start questions while I'm pounding the keyboard here? Any questions first?

M: [inaudible]

Richard Brennan: NT-1 — in the United States you do have to buy the NT-1. In all the reasonable countries of the world it's part of the telephone company, but for you today you get to buy it. It can either be inside the box — it's functionally separate — but it can either be inside the box, and then the big question in terms of buying criteria for you is does it give you back a T interface that determines whether or not you can provide another connection off of that?

M: [inaudible]

Richard Brennan: In some, yes, it is included. Most of the vendors in the United States, to simplify the installation, are bundling products usually [inaudible] either with or without an NT-1. That's on the end-user device. Now, on a PRI-connected circuit, you don't have a separate box, called the termination; what you have is the typical functionality that terminates at T-1, and the functionality is there, but it's not a separate, small, cigarette-pack size box like you get in the individual user devices.

Here on the East Coast what I've found is that the number of Internet access providers is not as large as back in California. There are dozens of Internet service providers in California that are setting up small services where you can buy access where you can buy service on an individual user basis.

The typical going rate is about \$30 for 30 hours of usage a month as an individual dial-up user. Now you match that with my ISDN line charge, which from Pacific Bell was \$37 to install and \$25 a month; then in Pacific Bell's territory I get free local calls, flat-rate local calls, from five in the evening until seven in the morning. So I can dial InterNex*Tiara — which is still within 12 miles of me — I can dial them at five o'clock on Friday night and stay connected until 7:59 on Monday morning and incur no telephone charges at 128,000 bits per second. That's fairly good service, you know. So it is doable. I wish I could say that the service was equitable throughout all the regions.

Here is this long, long list of hardware equipment types [on Dan Kegel's ISDN Home Page].

M: [inaudible]

Richard Brennan: InterNex is charging me \$30 a month for my basic access — it's for the first 30 hours, and then there's an increment after that. I exceed that most of the time, but then my telephones — I haven't gone through my \$25 service charges because I make pains to make sure I'm not calling during the day when that is a message unit. In Pacific Bell's territory it's four cents to originate and a penny a minute, so it costs me sixty-three cents per B channel per hour to stay connected. Even if I'm telecommuting, this is not going to break the bank, you know, so it's \$1.26 for 120KBs for an hour. So you can do eight hours of corporate access and not have an outrageous penalty for staying connected.

I'll just look through the list here. These are the terminal adapter providers, and you see that big names are here — Cisco, 3Com, Ascend, IBM, Motorola, U.S. Robotics — it seems like I thought [U.S. Robotics] made modems — nothing in ISDN is a modem. I detest the terms "digital modem" and "ISDN modem," but it's becoming popular in the press release wars and in marketing. There's nothing going on in there that's modulating and demodulating anything, so it is not a modem. AN ISDN terminal adapter maps straight zeroes and ones of your computer into the zeroes and ones of ISDN, unless it has a modem or DSP functionality for emulating a modem or a fax/modem capability.

[Inaudible] is a DSP that can go right into your PC computer and can emulate a fax/modem as well as talk to your Internet service provider, using PPP protocol in pure digital, so I could be sending a fax on one channel and be up on the Internet at 64KB on the other channel. That's a fairly nice capability out of one line. You'll see a lot of these.

Routers and bridges: ACC, Ascend, Bay Networks, Cisco, CombiNet, [Digiboard], Gandalf, the Network Express — the same players that you've worked with in setting up your routers and your bridges. Every one of them is now building ISDN gateway devices, and some of them that are perhaps not as traditional — people like [inaudible] are coming on board with new products that allow — [inaudible] has been very big in the Macintosh networking arena, and they're the kind of vendor that is now adding ISDN to the set of applications that they're able to support in networking.

More questions? Yes?

M: [inaudible]

Richard Brennan: How much do you want to pay? I have seen cards going for as low as \$250, and I've seen cards going for \$2,000. When you buy a \$2,000 ISDN board, what you do is basically plug in a very stupid \$900 computer as a peripheral to the board. The board is handling everything — it's got a fast processor, it's got many megs of memory, it's an intelligent co-processing board to which you can plug a very dumb computer.

At the \$200 level, which I think we'll see here either at Christmas time or very shortly thereafter, what you get is a very low-functionality board. These boards have been real popular in Europe now for a couple of years. That's where you're using the strength of the computer; essentially you use bus cycles in your CPU to run the ISDN communications. Remember, the computers are not used to running three or more logical sessions out of your computer at very high speeds, so they're having to gear up to handle that. It takes the current generation of better processors, the better communications toolbox or driver capability to be able to support that. So the less you pay for your ISDN interface, it turns out, the more CPU time you burn in your computer.

I'd like to get back to the ISP service. The basic thing that we're looking at here is setting up — I want to call it an "I-squared SP," ISDN Internet service provider. Basically those people are all buying the hub-type products, the network managing them against servers, which are then able to offer services. I'm involved in community-based services in California such as CityNet, and [C-4Net] up in Northern California, which is doing that on a community access basis.

So if you can get a small grant to put together your own connection as an ISP, you can then become a "public access network," or a PAN network. We've seen some literature from Smart Valley in Silicon Valley about setting up those kinds of networks. Alternatively, you can find space on other people's networks that are already built as commercial networks and set up a virtual community network using capacity in what was a commercial ISP, because a lot of that community access is done off-hours. So it's very beneficial to allow community members to access into the service node off-hours, where you have less of the business load that would be tying up their servers and gateways.

For setting up an educational or a corporate network, basically you have to decide how much of the business you want to do yourself in terms of administering as a corporate or as an educational system administrator. How much network management tool do you want? What kind of capacity do you think you want to provide? What types of dial-in capability are you going to support? Are you going to support the evolution from modem technology up to digital? Are you going to try to get everybody to go digital at day one?

My neighbor across the street, who works for a large petrochemical research installation, started out ISDN dial-in with only a few small stand-alone terminal adapters. When the senior scientists at this particular company found out that they could do their literature searches on-line to a database that has all the graphical text search engines built into it, he could no longer handle the load individually. He had to give it over to corporate telecommunications to start building bigger and bigger service.

He showed them a videotape of his workstation inside the research area, showing him accessing this application, and then it showed him dialing in from home, and you could tell which one was the home application because the access was faster than through the corporate network. Now, you say, how could a dial-in connection at 128KB be faster than a 10 megabit connection to his desktop? And the answer is, well, it wasn't really to his desktop, it's past his desktop and it's routed through a couple of the buildings in the network and it's congested; so a congested local area network in a corporate environment or an educational institution may be very much slower than dial-in access to a gateway hub located right next to the server that you're trying to get to.

So less is sometimes more in networking here, and that's the kind of thing that causes people to really like to be able to dial in to corporate and educational networks.

The other issue is, how am I going to access the Internet? By dialing into my network and gateway out to the Internet? Or am I going to dial into a commercial Internet service, and then gateway back into my corporate network? This raises — there are lots of vendors with plenty of solutions for you.

[There's] the issue of firewall and filtering servers. How do I allow the right level of access in and out of my network to the public Internet? And how do I set up this mixture of people in my network dialing out, and people from outside trying to dial in? So you can set it up either way; they both have very excellent applications in usage within the network. You may want to do some of both, but make sure you understand. You don't want to just open up a gateway to the Internet and allow everybody to dial in to see what your corporate research looks like; nor, perhaps, do we want to allow little Henry from the seventh grade to dial out into everything that's available in the Internet. We don't have all the books from our libraries in the middle school library, nor do perhaps we want everything on the Internet flashing up on screens in the middle of the seventh grade lab period.

So with that, I'll take any more questions, and then we'll get ready for the last session here, which is on getting ISDN to the home.

M: [inaudible]

Richard Brennan: Surprisingly, very few of the [inaudible], I think, have become Internet service providers yet, although we hear announcements coming that they're going to do that, and I would imagine that will be the mechanism for how they do that. I have not seen explicit plans to do that.

Mostly it's what we'd call "centrex resellers." An Internet service provider signs a contract with a local phone company to become a centrex reseller. They've done this in the voice arena for quite a few years, where a person who owns a building would buy centrex and resell it to all the tenants in the building as a shared tenancy. An Internet centrex is a shared tenancy centrex where all the addresses didn't happen to be at the same spot.

I see it more from independent Internet service providers. The expertise required to be a good ISP and to provide a good level of support — it's not immediately intuitive that this is the same level of expertise that you need to run ISDN telephone connections. So those are

two different businesses, and they both sort of lean on each other for support. I'm not sure that either one can take over the other's business.

M: [inaudible]

Richard Brennan: I'm sure that when [inaudible] start getting enough connections to be able to offer those services this will be something they will jump on. Usually they will have fewer switches, and they will be more recent switches, so they will definitely be ISDN-capable. The question of how they can cost-effectively offer that to businesses, and especially to individual users, will determine whether or not that's a successful strategy. And that's a regulatory issue, so you never know the answer.

Any more? I thank you. For those of you who want to really do this yourself and hear a third variation on this talk, we're going to talk about ISDN to the home in the next session.

INTERNET TECHNICAL ISDN: AT HOME



SPEAKER

Richard Brennan

Technology Manager, AT&T Network Systems

Richard Brennan: I'm sure this area will cause a few questions. My name is Richard Brennan, and I'm with AT&T Network Systems; at least that's who I thought I worked for until AT&T announced this recent breakup into three companies, so — as we refer to ourselves internally now — I'm with the “No-name Company,” or perhaps some symbol and the “Company Formally Known as Western Electric.” And it will not be Western Electric, it will not be anything but AT&T and we will have a new name, probably in March when we emerge as a \$20 billion start-up company. And we will be doing a stock offering at that time, so I'm sure they're going to have a name for us then.

My role is as a technologist. We are the technology partner of a lot of service providers, in bringing ISDN to you and to commercial service providers, to businesses, educational institutions, and my role is to support Pacific Bell's efforts in California, and so I betray my West Coast origins by knowing a lot about what's going on out there, and not quite as much here except what I hear via the rumors of what's going on here.

Now, the unfortunate thing is that I think what's happening on the West Coast may be a little bit ahead of what's going on here, so it's more of a goal rather than something that's happening in the same quantities; although we do hear that in some locations out here you can realistically hope to get quick and easy access to ISDN, but it is not at all pervasive.

My first question to the audience is going to be, how many of you know what ISDN is to a level of comfort that lets you discuss that? How many of you wish you could get something like high-speed access to your home, like ISDN? And how many of you already have ISDN to your home? One, two, three, four, five, okay. Those are about the right ratios, I think. Everybody wants it, and five percent of the people may be able to get it. The numbers are not going to remain like that, because the technology is becoming pervasive and it's more of a regulatory and economic issue as to the availability of ISDN.

What I'm going to do here is a little overview of ISDN for those of us that don't have a full understanding to discuss the issues, and then we'll talk about how to really implement it in your home; and I'll use, as a framework for that, my experience as I set it up in my home.

ISDN is nothing more than “international standard for a digital telephone” line, but when we say that we have to divorce ourselves from the thinking that somehow a phone line meant a pair of wires and a thing at the end that looked like a telephone and had a phone number to it, because the new digital model doesn't look at all like that. How many devices I have on the line is something that's contained in the software relationship; how many phone numbers I have on that line is a software relationship; how many different types of conversations I'm doing on the line — voice data, packet data — that's controlled by software, so it is very non-linear, and for that reason sometimes we get confused because you can do many things at the same time, and yet we're trying to talk about them one at a time. So remember, we can do lots of different things.

What we're going to talk about here is the set of things I need to bring ISDN into the home. ISDN, for most of us, will be delivered by our local telephone company, so whoever is providing your phone service to you today is probably who, in the immediate near future, is going to be providing ISDN service. Now, that's not to say that sometime down the road a cable television company or an alternate access provider or someone else might not be able to

provide ISDN; but I think those are awaiting some regulatory processes and decisions and some marketing decisions. They are quite a bit further down the road than you might think, and so probably we're looking at the local phone company as being your source.

Now, their line might be resold to somebody who's marketing it to you, and that's a slightly different technical issue, because it's still coming from the telephone company switch. The good thing about ISDN is that it comes into your home on the same kind of pair of wires — in fact, it could be the same pair of wires — that ran your analog telephone service.

Now, I said "could" because I'm not going to recommend that everybody go out and get rid of their analog telephone and put in an ISDN line, for one minor reason. You see this little power unit down here? ISDN lines are all microprocessor-controlled devices, and they have microprocessor-controlled devices on them and they don't run out of the battery power that is provided by the phone company like your analog telephone does.

So when the hurricane hits — or in California, when the earthquake hits — and the power goes off, you will not have telephone service on an ISDN line because your local power will have gone out. Of course, you don't have power to your computer, either, and I don't know how you're dialing the Internet... But that's another issue. So I would always recommend that for home use you leave in your analog phone as your first phone line and put your ISDN line in as a second or later phone line. In my case, with a wife and two daughters, there were three phone lines and you can imagine who did not have access to a telephone line. The Internet is not a reason that we should interrupt social discussions around my community. We've rectified that.

So the elements that we're going to look at, [and the ones] that you're going to need — these are functional elements. [The first is] the network termination. The network termination is an electronic piece which does nothing for you; in all of the reasonable countries of the world — the network termination is here, labeled NT-1 — that is part of the telephone company's equipment. In the unreasonable country in the world, one with a market-based telecommunications policy, you get to buy it. So you will get to purchase an NT-1 even though it really does nothing except change the two-wire connection that the telephone company ran under the street to your home or to your business into a four-wire connection, which is the international standard for delivering ISDN within your work group, within your home, on your desktop. So the four-wire connection is what runs inside the home.

On an ISDN line we can derive channels, so there are not free wires on an ISDN line, there are free channels in the ISDN line that's going to be pulled into your home. Now, think of your existing phone line; it only has one channel. I mean, it has one analog capability and you can either be talking to Aunt Millie or you can be dialing up to America Online, but you can't be doing both. You can only do one thing at a time. You say, "Well, it has extensions, and all of those people who happen to pick up those phones — they are not additional phones on the line, they are really additional handsets all connected to the same communication stream. You're not getting multiple conversations.

ISDN can support multiple conversations, so I could be talking to Aunt Millie using a voice capability on that top channel we call a B channel there and at the same time I could be using the second B channel to dial up to my Internet service provider at 64,000 bits per second — that's two-and-a-half to five times the speed that you're going to get from a modem — and at that same time I could be doing an electronic mail message in X.25 packet data service to my electronic mail delivery service.

So I could be doing three different communications using three different mechanisms to three different destinations; you just can't do that on an analog line. That's the power of ISDN. It's all digital, it's standardized for all of the communication vendors — you're going, "You say all, there must be somebody who's not," — but essentially all of the communications hardware

vendors you're going to see out on the floor here are building products to suit this standard. It is the standard for digital connections over the public network.

Now, we get into some considerations here. You saw that there were multiple B channels; one of the things that I have to ask when I'm going to sign up for some service and pull ISDN into my home, I say, "Well, where am I going to dial to?" And usually I'm going to dial one of two places: either a corporate local area network or an educational local area network. So I'm going to dial a gateway at my company or my school or I'm going to dial into a commercial Internet service provider — and, as I said, we have two B channels there — so one of the first things I say, is "Well, gee, can't I stack up those two B channels and get a service that's 128 kilobits worth of service?" And the answer is yeah, you can, and there are two methods for doing that.

The older method is called "bonding." Bonding says that I'm going to take those two channels and I'm going to stack them together and give that total bandwidth to my PPP session, which is the session that's going to connect me up to the Internet. But that function is totally separate from whatever product I was using that's originating my dial-up LAN session. So I've got the same connection whether I'm dialed up to my corporate LAN or whether I'm dialed up to the Internet, and for that function the IMUX, or "inverse multiplexer," says I'm going to take one stream that's my packets from my PPP session — which is how I talk to the Internet — and I'm going to divide those up and split them amongst multiple B channels.

It used to be, a few years ago, that IMUX was an entirely separate box and you backed it up behind a router in your LAN-bridging world and said, "Now I'm going to divide that up separately." Well, there's a new protocol out, as some of you mentioned, and that protocol was just published in 1994 and it's called "multi-link PPP." And that says that my LAN application, my software — that's my TCP/IP communications software that lets me communicate to the Internet or lets me communicate to my corporate local area network — is going to understand about these channels. Well, before it didn't know about them; it thought it was delivering one big pipe. Now it actually knows about how it's going to divide up the packets so that it can talk over various links. Why is this important to you? Well if you're going to go out and buy a piece of equipment that you're going to use at your home, first you have to have an idea of, "Who am I going to dial to?"

Let me back up to modem technology. If you went out and bought a 28.8 modem and said, "This is great, now I have a 28.8 modem, therefore I can dial everybody in the world at 28.8, right?" No. If they don't have one too, you aren't going to talk to them. View this as the same situation; if I buy a device that talks bonding only, I better find myself an Internet service provider or a corporate LAN gateway or an educational gateway that talks bonding. If I buy a device that talks multi-link protocol - [which is also called] MP — I need to make sure that my commercial gateway, corporate gateway, or educational gateway is talking MP.

So that is a primary decision point in what you would decide to place on your desktop for getting ISDN in your home and then gatewaying to some external service. Oh, and by the way, if I wanted to talk voice there's a number of ways I can do that, too.

So here's sort of how this network looks. I can have devices that do plain old telephone-type service — you know, my beige, government-issue 2500 set-up there — and also a data connection to my PC; or I could have a nice digital set, and it also has a data connection to my PC; or I could have a data-only device called a "terminal adapter." Terminal adapters and ISDN replace the functionality of a modem in the analog network. And all of those could be dialing in to some point of access, and that point of access is either going to be a commercial Internet service provider, my corporate LAN or my educational institution. And I can pick and choose some variations as to how I connect here.

Let's look at some of the ways we could connect up. The kind of equipment that you're going want to put in your home is going to depend on — you know, you have to ask yourself the hard question, "What am I really trying to do here? Am I just trying to access the Internet at high speed or am I trying to set myself up in a service business where I really have a home office and incoming phone calls are one of the most important things I have, because that's how I get all my business?"

Well, if I'm doing mostly voice and a little bit of data, I might want to put a digital set in my home, because that then offers me a high-speed data connection to my PC. That might be a viable set of services. If I wanted more data capability, higher bandwidth data perhaps, and two channels instead of one channel of data, and I was willing to settle for just an analog telephone set, I might choose a different configuration based on a board that we call the PCTA, the "personal computer terminal adapter," and it has an RJ-11 jack [which is] a voice telephone jack that lets me plug in my old powder blue, trim-line set into that board. But there's other variations.

M: [inaudible]

Richard Brennan: Yeah, but I don't think that should do it. It should still click.

Okay. I can pick another type of terminal adapter that would supply a mixture of both voice and high-speed data services from various vendors. This is an AT&T product; there's a Motorola *BitSURFR* product, and it's very similar to that. And I could then say I could support both voice and data kind of evenly, or I could just say I'm going to do data only, I'm just going to access the Internet. That determines what kind of equipment I want to pick on my line and it determines how I'm going to order my line from my service provider or my local telephone company.

Now, there's more variation here because I can start doing multiple things on the line. Here is a device that's got a telephone and a fax modem plugged into the back of an ISDN adapter. Faxed phone calls are voice phone calls to the network; modem phone calls are voice phone calls. Remember, modem and faxes send their information as tones down the network, and that's a voice grade of service. Even though we think of it as data, it is not to the network — it's voice tones.

So in order to send faxes and modems to people at the other end of the phone call who don't have ISDN, I need a method to convert my fax or my modem information into digital information, but carried on a voice capability just to the Net; and that's what this terminal adapter does by supporting an RJ-11 jack on the back. But at the same time, in another B channel, I can be supporting a 57.6 kilobit data connection, so I can do a data capability out of my COM port at the same time I'm doing a voice capability from my modem. This is confusing, because you can do many things at once.

Here's a device called the IBM *Waverunner*. Unfortunately, I checked at the IBM booth today and they don't have them running at the booth, but they do have the literature. The IBM *Waverunner* — say, what if I needed a product that I could talk to almost anybody on? I need a product that I can talk directly to a digital Internet gateway, and I want to be able to talk on two B channels. The *Waverunner* will do that. It's a PC board, but it will talk down both B channels to your Internet service provider, so I could get a 128,000 bit per second connection to the Internet.

But what if I wanted to talk to this AT&T telephone over here? This AT&T runs an asynchronous connection out of my COM port at 57.6 kilobits per second; well, the IBM *Waverunner* says, "Yeah, I can do this protocol." It's called V.120, and it is the same for

asynchronous ISDN phone calls as V.34 is for high-speed modems. [It's the] same relationship of the protocol to the telephone capability, and so we can talk there.

So I'm talking two B channels to the Internet, or I could talk one B channel of data to that phone and one B channel of voice to that same phone. The same phone number, two different things. But then the real kicker comes and says, "What if I want to talk to somebody who doesn't have ISDN, but they've got a modem?" Normally you'd think that meant you would have to have a modem somewhere. The *Waverunner* gets around that by using a DSP chip on the board to pretend it has a modem, to emulate a modem or a fax modem capability. So it says, "Now, if I was a modem, I'd have sent a signal that looked like this after it was digitized." It inserts that digital signal right onto the ISDN line, and then you can dial to a distant fax modem or a distant data modem as well as the ISDN connectors.

So that answers the question, "What would I do at my end to be able to talk to all the different kinds of endpoints that I might want to dial to?"

The other side of that equation is, "Can I call up [inaudible]? What if I wanted to just set up a connection between my corporate or educational gateway and my home or my dormitory for LAN access?" That could be Internet access gatewayed out of there, or it could be just for the kinds of computational things we're going to do on a TCP network, in a school. I might use a device like that Cisco *Pro*. That's the old CombiNet boxes that — Cisco just bought CombiNet, who has been a provider for quite a while in ISDN, and so Cisco's one of the major router manufacturers in the LAN area. So I would just put that box in and I would then have a very short local area network in my home. And perhaps it would be no additional wiring in my home, because I'm just going to run that new interface line, that two-wire line, to the Cisco box. It has a power plug that I didn't show here. And then I'm going to have a data connection, which is just one patch cable between the Cisco box and one computer. That's a very efficient and almost no-wiring solution for my home, and that is a connection that would give me good access into this kind of a corporate or educational environment.

What if I want deals that are more sophisticated? This is what I've actually wired at home. My daughter was complaining that from her Mac in the bedroom she couldn't spool her print jobs out to the laser printer in the front room; this is what 13-year old young ladies want to do these days, so it's the truth, thank goodness. So I decided to wire a local area network within the home. Well, companies like Sonic Systems, which is what I've used here, have these little mini-hubs. I picked mine up for \$159 and I've wired three bedrooms and my computer office — which has both a Mac and a Windows machine in it, and the laser printer — and we're all up on this little mini-hub and essentially now I've started wiring my home for local area network connections.

And once I've put that in, I took a little bit of care to wire that around. I made sure I used some good quality Category 5-type cable, which you can get down at almost any electronics store. I don't know if Radio Shack carries it yet, but I'm pretty sure they're getting pretty close. And I made sure I had nice straight runs all back to — I put the hub in the closet by the door that also has the hatch where I can get into by basement, so I can get under there and do wiring work on it, and then I plugged it in and I tried a couple of different boxes.

I used that [H&T *Express*] box and I've used a Pipeline, and I'm currently using a CombiNet box there that allows any of those computers on that little local area network that's now in my home to access the network. So we're either using one or two channels now to allow this little mini-home network to access the Internet. I'm currently the only one who has an account; I've bought an account from a commercial Internet service provider, InterNex*Tiara out in California. It's a \$30-a-month account, and I'm now able to dial to that account from either my wife's Windows machine or from my Mac, so it doesn't make any difference which machine I'm [working] off of — I can get to there from here.

So this is a very viable home installation. It is, in fact, the same model you'd use in a small school or a small office. It's going to build a small network, one ISDN device off that small network, and subject to how many IP addresses my service provider's willing to let me have and how many IP addresses this small terminal adapter will let me have — and some of them are limited in the number of addresses they can handle — I can allow all these people to share access on the bandwidth that I've bought up to the Internet.

Now, remember that in California, in the evening, I'm not paying any telephone charges here from this access because my service is less than 12 miles away from me, so I'm able to dial to my service and use it all evening for no telephone charges. I just have to watch the number of hours I'm up on the Net, because I get billed for overage, for going over a certain number of hours on the network; and once you let your kids find out how to do this they will exceed the number of hours you've bought. It's a law.

Okay. So, we're looking at putting things together here and where the costs go. Remember, I did not rip out my analog telephone; actually, I did not rip out the three of them, I just left them where they were because I didn't want to mess with that. I provided power, I provided an external NT-1, and that allows me to plug in and out the various devices as I'm working with them, because I don't always want to use the same device.

The next thing I'm thinking of adding to this network is a video conferencing mode for my house. You'll find video conferencing capabilities to be added to your computer coming down through the \$1500 barrier and headed for the \$500 price point, so it starts to make video conferencing a very viable alternative for working at home environments.

And then I have my external terminal adapter, and I think how much these things cost — I can go down to Fry's Electronics in Santa Clara and buy a Motorola *BitSURFR* for \$249. That's a dual B channel data ISDN terminal adapter. You thought, "Well gee, isn't that what a modem costs?" Well yeah, it turned out that it took the dynamics of enough people starting to buy ISDN in the quantities they did to make the manufacturers ask the chip manufacturers to build chips that did this cost-effectively, and so Motorola, Texas Instruments, Intel, AT&T Microelectronics, beat National Semi — these people are all now building ISDN chip solutions which are being built into products.

I think you'll find that ISDN devices will start to come out, function for function, at the same price as the equivalent modem products, but they'll run multiple channels and they'll run data five to ten times faster at that point. Now, everybody raise their hand who wants slower service. Okay. You just don't hear those complaints a lot. So everybody wants more CPU power, everybody wants more communication power and this is, in fact, the way that you can get them.

And what I'd like to say is that I can get the communications power that's on peoples' desks at Xerox PARC or Lawrence Livermore National Labs in California — I can get that at my home. The only difference is that I don't have the FDDI connection running past the desk that they have. That's a minor point. [But] for networking, I can do it.

So these are real, real street prices, if you will. Ninety-nine dollars to \$250 for the NT-1, and sometimes the NT-1 is built into the terminal adapter; \$200 to \$1200 for the terminal adapter; \$150 to whatever you want to pay for a little hub to go in your home; some Category 5 wiring; some good quality 8-pin connectors in your walls, and basically you can start to put together a home network, that — if you build it correctly, now — is going to last you for this application and will allow you to upgrade all the way up to 25 megabit ATM service some day — "asynchronous transfer mode" service, when some service provider decides they want to offer that to you on the network.

And how would you integrate that service? Well, you'd just plug that new thing in, and whether it was a cable modem providing [inaudible] of access or an ATM adapter providing bi-

directional access, you just plug it into the hub as another node on the network and have another gateway. You haven't thrown away anything in that network to add that new service. So it's my recommendation to you that you consider starting to do this in the home as you want to grow these services and sort of elevate your home to the same kind of connectivity that we've grown used to in business and educational institutions. You don't have to do this, however; you can, as I mentioned before, just run one device on a pair of wires, plug your computer into the back of it and just handle the one computer. This is a little more visionary approach if you want.

Where to check things out... I cannot recommend highly enough Dan Kegel's ISDN Home Page, and I'm going to show you that in just a second here. Your service providers you can get at bellcore.com. For individual users there's almost a better source of information at Intel's "Technical Help Desk," which is up on their Home Page under "technical assistance," and I can pull that up here in just a minute.

The Intel information will tell you what kind of ISDN service availability [there is] and what the costs are in your area. In fact, if you're interested in their ProShare service or their LAN access solutions, they will then facilitate an entire order for you for getting that service up and installed in your area. So I think there's a lot of Internet service providers who are starting to assist individuals in building these connections to their homes. There are also VARs, or "value-added resellers," who resale a lot of ISDN products and who will assist you in getting this to your home. Or you can go out to an electronic store and breadboard it together yourself.

And all of those can be very, very successful. You're going to be into different pricing schemes, [and with] your Internet service provider, each one seems to be different. Each telephone company in each state seems to have a different pricing philosophy on the installation and the ongoing charges for ISDN. In California, I guess I have it pretty good; it was \$37 to install the ISDN line, it's \$25.40 a month, and I don't have to pay for my phone calls within my calling area after 5:00 p.m., from 5:00 at night to 7:00 in the morning. So I can stay on my service provider in the evenings at no telephone cost to me [except for] the Internet service cost.

Now, [there are] some things you need to know. There are several types of switches you'll need to know, and you'll need to become network aware when you start ordering the stuff. What flavor switch is my service provider giving me? The AT&T or the NORTEL DMS 100 are the two most common. There's also Siemens' and Ericsson's. By the way, for those of you taking notes, this will be on CD-ROM, and it will also be up on my Home Page, at www.image2000.com.

Then you'll need to know what kind of line software the telephone company put in. Is it "national ISDN," [or what we call NI], which came out in about 1992 and is just now being deployed throughout the telephone networks? Or is it what we call "pre-nationalized ISDN," or custom software? You'll find variations, depending on which service providers are providing what kind of service. You need to know what kind of software the device you've just bought will handle; some of them will handle both NI and custom, and some of them will handle NI only.

There is another thing you must know. Do you have an [NC2B12] interface? I would expect the answer is yes, but if you're behind a PBX or some other ISDN key system and you're in a small business environment, you may have the T-4 wire interface directly. You can't plug something that needs the U interface into something has the T interface. You have to know your SPID. If you're behind any DMS switch or any nationalized ISDN service, you will need to know a SPID. It is the most commonly-made error in getting your ISDN working — incorrect SPID information. If you don't have the SPID... The SPID is what identifies your piece

of gear and your phone number and all your services to the public telephone network. If you don't have the SPID in correctly, the network doesn't know who you are and the switch cannot talk to you, so it is the number one thing.

The next most common thing [is that] you didn't match up the set of services you ordered. Remember, you can use voice services, data services and packet services, multiple directory numbers, all of these fun things — you didn't match what your equipment wanted to see out of the network with the order that you placed on the telephone company. Many of the telephone companies now have facilitated order desks that understand the stuff.

Be careful in ordering a home ISDN line, and in who you call. Don't necessarily call your residential service center to order an ISDN line. They may say something like, "Can you spell ISDN?" You know, "What is that?" The reason is that there are hundreds of people taking residential phone orders, and the telephone companies just have not had the opportunity to train all of them in what ISDN is.

Pacific Bell, for instance, has a single phone number, 1-800-4PBISDN, that'll get you to the right people who are specialists in ISDN. You tell them, "I want a home ISDN line and I'm planning on putting a Cisco 752 on the line." And they say, "Oh, we know what that is, and here's what you need." There's an excellent chance that line is going to go in perfectly the first time. If they don't have a service center like that — and some of this information you can get from Intel or from their Home Pages on the Web — then I'd say call the business office in your area for the telephone company and say, "I'm trying to install this ISDN digital phone line." Walk all the way through the process, get them to answer all the questions, then give them the address afterwards and they'll say, "I don't know where that is" and you say "It's my home, you know?" Don't tell them it's your home first. Get them to answer the questions for you; they will probably tell you exactly how to place the lines. But you need to do that through the business office.

And I don't mean to be devious here; I'm just saying that those business offices will have somebody with the expertise to handle an ISDN service request. You're going to pay different things in different parts of the country, so unless I could put up fifty variations here I couldn't answer all the questions on how much your service work will cost you. Depending on which service provider you dial to, you may get anything from a free connection at a university or in your corporate network to a dollar an hour or a \$10-an-hour range from a commercial Internet service provider.

Now what I want to do is shift gears here and show you some of these Home Page items and answer some questions at the same time. First, here is our Home Page in San Ramon. This is the one where we will post these three presentations we did today in GIF format so you can download the slides on a slide-by-slide basis. And it's got some information

The one bookmark that I highly recommend is Dan Kegel's ISDN page. The quickest way to find it is to do a *WebCrawler* search on Kegel and ISDN, and it will come right to the top of the list. This is the authoritative page on ISDN, and almost everything to do with ISDN is on this page. If I went down to the bottom here and took a look at the index, you can see all of the questions that are answered here on ISDN. It's got tutorial information, and even tells you where to get books.

By the way, the new book that's out is called *ISDN for Dummies*, and even those of us who have been in the business for ten years read it. You know, you always learn something. There are a number of good books, other good books at different technical levels. And then you get into the hardware, and if I was to look at the terminal adapter list from which you have to choose, in addition to the vendors out here on the floor, you're going to get a *Netscape* error.

So we turn to the trusty Mac and try again, where I don't have all the bookmarks, so I get to actually go through and do this. So I'll do... I think we managed to pull the Network down, that's great.

M: [inaudible]

Richard Brennan: Thank you. Now I've got a back slash. It's never my fingers' fault, it's always the keyboard's fault, have you noticed that? There's Dan's page. Let's take questions now. Any questions? Yes?

M: To get this little local area network architecture, like you have in your home, did the terminal adapter that you use, does it deal with [inaudible] between different service providers, that different computers often have?

Richard Brennan: Remember, it's a telephone model, so it is dialed up to a service provider. However, if all of the workstations on that little LAN have an IP address known to that service provider they can all be dynamically connected on that single connection. Now, yeah, they're all contending in terms of bandwidth, but that's handled in the TCP/IP protocol stack in the PPP connection. Now, it is conceivable that I could have, like an Ascend, one connection to my university and one connection to a commercial Internet provider, so I could be doing two remote connections at once and then, depending on where I was obtaining information from, I would actually have a crude connection between the two. So there's some interesting interactions there that are not always beneficial, and some people in that environment preferred filtered bridges to do corporate access to avoid that kind of inter-network routing problem. Does that answer your question?

M: Yes. Well, part of it. It's not going to be able to suspend long-term connection and/or request to connecting numbers, and a service provider comes in [inaudible] that's one of the advantages of ISDN, it's very quick.

Richard Brennan: Connect times.

M: Connect times.

Richard Brennan: Yeah, some of the board-level products will clearly be able to do that. And I think we're right at the verge of having some APIs between some of the access devices, and the computers for the access device would be controlled directly by the computer to be able to do some things like that. The protocols are there in the switches.

Things like data-call-hold are already in the switches, but I beg to ask, what is your communications software [going to] think when the switch goes data-call-hold? Most software is going to think the network just went south for the winter. It doesn't understand a suspended call in the way that his telephone-held call is; so we have to match those things up, and that's basically some API work that's currently underway at different levels and some different organizations, to make all that stuff come together so that yes, you could suspend this channel in order to connect up to that channel and go and retrieve something quickly, ditch that and go back to my suspended phone call. And remember, this could be a mixture of voice calls, fax calls, Internet access sessions, telecommuting sessions and distance learning sessions all in the same set of capabilities. Yes?

M: Yeah, I have two questions. First question for you is what's the physical wire connection for like a ATM going into the home? If you were to substitute the terminal adapters for ATM, is it...

Richard Brennan: I don't think anybody's standardized that. There is no residentially-standardized connection, and that's one of the minor issues. Since it takes about ten years for those standards to be built, it will be real interesting to see how that happens. I would suggest that most of the time it will be some kind of a connection that looks to deliver you what amounts to a 10BaseT or some connection that looks like that, as an industry standard connection directly out of an ATM connection.

But how it gets to your home — number one, it's not going to get to your home on the twisted pair that's in there now, because that pair won't serve higher than ISDN-type bands very effectively. And if you want to run ATM at 25 megs, that just — they're not going to throw that on the copper pair that's running around under the streets. That's what hybrid fiber-coaxial networks are all about, from fiber and coaxial cables, to get those kind of connections. And that is being done, and those services will be delivered over those networks before the end of the decade. Another question?

M: Yeah. Is the per-minute connect time charge a phenomenon exclusive to the New York area, or is that typical of ISDN charging structures?

Richard Brennan: It's typical of all business-grade telephone structures, and except [within a] few enlightened areas, ISDN is sort of then construed as a business type of service. I would put Pacific Bell in the enlightened arena, but even they knew that ISDN use during the day is most probably [going to] be used for telecommuting, so ISDN is "major great" during the day. Magically, during the evening when there's going to be on-line service access and Internet access by students and things like that, it's flat-rated; so they've tried to sort of tread the middle ground there and provide a service that met both requirements of recovering the billing minutes that you needed from commercial users but also providing inexpensive access for consumers.

I mentioned in the service provider session a little scheme called an "ISDN centrex," which gets around that by linking together all of the users in a single telephone wire center into a centrex, and has those ISDN lines then all be able to communicate without incurring message-unit charges. That may or may not be permissible under the tariffs filed in any given geographic area, and there may or may not be an ISP who is willing to set that up. Yes?

M: [inaudible]

Richard Brennan: Very commonly, yes. A lot of them have both a RJ jack and a 10BaseT and a 10Base2 on them. [There] are a lot of small TAs [that] have both. I just used a twisted pair because it was easier in the home, because it fit more the wiring scheme there. Questions? Yes?

M: Are you familiar with European ISDN?

Richard Brennan: A little bit. Euro2 is the EC standard, but there are variations for the French and German and UK networks.

M: So is that to say that a device that's U.S.-ready is not European-ready?

Richard Brennan: The [2B12] NT-1 is an American-only artifact. The T interface is very robustly standardized internationally, and in fact you can probably take a T interface ISDN device to more countries than you can any modem that you know of, and plug it directly into the network.

What you need is the software drivers for the D channel signaling protocol for those countries. And a lot of the vendors are real interested in selling internationally, because one of the great things about having an international protocol is you can build a global product. So many of those vendors do have the protocol stack for those other countries and yeah, you just request, say, "Hey, I need to run in Germany or France, and do you have the protocol stack that supports that?" You add that to your buying criteria and it will limit your choice of terminal adapters, but it does not close you out.

M: Do you know of any of these? Who should I look for?

Richard Brennan: Well, you can start with KNX, because they're from England and theirs works over here, so I think that would be a good one. Ascend certainly has made their products work internationally, and I think Cisco/CombiNet has too, and the rest of them I just haven't looked at closely enough to know. A voice telephone will be about the last thing; digital voice sets will be the last thing to be added to that list. They are the most difficult to communicate with the signaling protocols.

M: Is it practical to run a Web server on ISDN?

Richard Brennan: If you have — if you don't have usage billing, sure. It may not be as efficient as frame relay, but there are tradeoffs there as to how you want to run it. We were discussing, down here in the front, running a weekend-only Web service off of a Pacific Bell line. It would be a very viable idea, but you'd need to connect then to a service provider who could aggregate up your traffic. You would only be able to take a discreet number of directly dialed-in channel connections if you had to terminate the lines yourself.

[Tape change]

Richard Brennan: Primary connections just have not really been put together for home use there; it's almost always business grades of service. Their four-wire T-1 type connections, they are very difficult to get to places like homes without special conditioning on the lines. There are some other technologies being used to do that; I don't view that as a mainstream application.

Those of you who just have to have T-1 to set up your Web site will want to do that, but the mainstream population is probably not going to get there. Even in the broadband arena when bandwidth is more deliverable to home I don't see that as a primary delivery method, because it's just not the increment you can dial easily. We don't dial in T-1 increments. You know, I think there's a reasonable limit of about 384 kilobits; it's the best dialing increment. And we will get to there. It has to do with the ways that the networks are set up, the way the switch networks are set up. But for just a connection you could come down from a carrier to a PRI, if they would terminate to your home and if they could lease the facility to get there. That is possible. Yes?

W: I have ISDN and I was in the neat little stack of hardware instead of instructions. I didn't know what I was saved from. It seems like if you're trying to get to a million users you're going to have to make this simpler. Anybody working on that?

Richard Brennan: If anybody in here had to pay the salaries of the stack of people working on that, I think we'd all go bankrupt. I think some of us are trying to. There are literally roomfuls of people working on that in labs in many locations, and there are many efforts underway to simplify things and straighten some things out, to arrive at industry consensus around doing things in a better way.

What we want to get to is a plug-and-play scenario for ISDN, and we are quite a ways — it's still a hacker's dream, and you know, it's not where I would want to hand this to Aunt Millie and say, "Here's your Internet access device, just enter the IP address in MacTCP and wire your kitchen for a 10BaseT and go to it." It's not going to happen that way; we have to make it more simple, and that will come as these products go consumer-grade.

If you'll remember, heaven help us, what modem installations looked like in about 1968, then you'll kind of know where we are in terms of ISDN deployment. It really took a lot of doing to get modems to work right back then with high-speed modems, 2400 baud, so we're in that stage. But there's a lot of people working on it, people like Intel with Intel Blue — which is a simplified provisioning scheme, so you'll order an Intel Blue line and then it comes up as a standardized configuration that everybody can support. That's being supported in a lot of places. Up there.

M: All right. [Inaudible] no placing in ISDN?

Richard Brennan: Absolutely. If the network, if the other end is busy, if the network is congested... One of my favorite busy signals for ISDN calls is when you try and dial at 64 kilobits and you get the "all trunks busy" signal. And what it says is, "The trunk group of capacity zero is busy, because your switch is only networked at 56 kilobits." So people will keep repetitively trying to dial at 64 kilobits and say, "This isn't working, I can't dial." And you change their setup to dial at 56 and it goes right though.

You can get busy signals from any location that is full up to its capacity to terminate calls. In ISDN however, that is not quite as linear as you might think, because you can have held calls and you can have multiple calls on hold, so if I have four data calls on hold, am I busy or not?

M: But if your ISDN is only one ISDN circuit...

Richard Brennan: But how many channels do they have? I mean, yeah, you could say that's subject to engineering just like everything else. If they only have 284 channels available and 285 people are trying to dial, somebody is going to get a busy signal. That's subject to the same physical constraints as every other type of service. And that's what I'm saying; this kind of dial-up service adheres to the telephone rules of dialing up. You own the channel, you can get busy signals. It is not the same as a purely packet service, where you just get slower and slower and slower until it seems like it is busy.

M: Yeah, I was wondering, is the *Waverunner* the only ISDN [inaudible] with DSP base in it?

Richard Brennan: It may not be the only one but it's clearly the leader in there, and I don't know of...

M: Does that give you better interoperability, though, to buy something that's [inaudible]?

Richard Brennan: Well, theoretically, the advantage of the DSP is that if I wanted a new modem interoperability I could just download a new set of parameters to the DSP. The *GeoPort* is another example of a DSP-based modem, Apple *GeoPort*. So those are the kind of capabilities that those are building on. Most of the other products use stand-alone modem chips to do the same thing, just because they are a little easier to engineer in and they are cheap. Yes?

M: How easy or difficult is it for ISPs to accommodate the clients coming in on ISDN?

Richard Brennan: What you'd need to do is ponder your mixture of incoming analog dial-ins and incoming digital dial-ins and select a hub gateway device that accommodates that mix.

I think the good side of the story is that you can buy some devices that will, just as we discussed here. With either DSP or modem-based technology, a single device behind a digital primary connection can handle hundreds of people dialing in with a mixture of analog, voice-grade modem connections and digital connections. So you don't have to build a separate modem pool and a separate digital pool; you can build one thing that's digitally connected and handle people with a flexible boundary of modem dial-in and digital dial-ins. And the digital dial-in can either be single-channel or multiple-channel.

So you go talk to the [Viasens] and the CombiNet Ciscos of the world and Network Express and Gandalf and those folks and you know, ask them about their solutions for ISP-type applications. There's another question on the aisle here. Yes?

M: Once you go through the setup to get your ISDN working, it is more or less flaky than a modem-based [inaudible]?

Richard Brennan: In my experience, once you get an ISDN line setup correctly it's about like the Rock of Gibraltar. It is just bulletproof. I have been in an all-ISDN building for over five years and we've never had a system outage; we run all of our office automation on ISDN and we're now gatewaying ISDN to TCP/IP. The worst problem we've had is an occasional wiring problem that causes a flaky set here and there, but we have not had one second of system downtime on the ISDN.

I challenge people with PBXs and LANs to make that same statement over five years. Occasionally we've had network congestion where calls couldn't get through from this part of the network to the AT&T network, because we're behind Pacific Bell Centrex for about three hundred lines. We've occasionally had network congestion problems but everything inside the building — all the networking, voice data — everything was working inside, and that's been over five years now. Telecommunications downtime is measured in the minutes and thirty-year periods. You know, it's little different standards that the stuff is built to. Yes?

M: What about connecting to your ISP, like [inaudible] 45, 60 minutes — whatever it is to the phone lines?

Richard Brennan: That's how you select ISPs, by the reputation for service, and it's not just — I think a lot of that maybe you're getting a quote "dirty analog line," so fundamentally if the ISDN line can establish a connection they tend to go up and stay up much more readily than analog lines.

A little anecdote from my building: I was doing a video conferencing setup inside the centrex — but remember, in my building my centrex line from my video room goes from my room down the street to Pacific Bell's central office and back to the laboratory — and I dialed up a 384 kilobit video call, which is a synchronous data call much like a LAN access at 384 would be. It was doing the “send” IMUX, and I dialed it up on Friday; and I forgot to tear the call down on Friday and I came back on Monday and the call was still up at 384 kilobits. Unfortunately I'd been away in the middle of the week, so it was a nine-day call at 384 kilobits.

I defy anybody to sustain any kind of a data call for nine days on any kind of modem capability and still have data synchronization in your application. It just can't be done. By the way, it was a no-cost call because it was intra-centrex. If it had been to Hong Kong I probably would have heard about it in my — in my previous job, you know. I'm a short-timer, I've only been there twenty-five years.

Okay. Any other questions? Last person out has to buy the cocktails, is that the rule here? Yes?

M: Where is the [inaudible]?

Richard Brennan: Well there are three AT&Ts, each of whom fit into the scheme. There's AT&T as a service company, and I cannot speak for them as to what their strategies are in ISDN. There's AT&T as an equipment company — we're committed to ISDN standards in providing a broad range of products that we make in our factories, and we have relationships with other vendors to provide for ISDN.

You just saw the announcement with [GBCS] and Ascend, and we're also building the hybrid fiber-coaxial network for three million homes for Pacific Bell in Northern California. So imagine a 750 megahertz connection capable of supporting, ultimately, things like symmetrical ATM and personal video conferencing and multiple ISDN lines and interactive television and cable television all on one connection to your home. That's the kind of technologies we're putting together with our service partners, and that includes all the LECs, the independents, inter-exchange carriers, and anybody else who likes to buy technology. So I think that's a very large role.

Thank you for your participation. After three sessions, I think my voice has just about had it, but if you care to come down here I'll continue to answer questions while I pack this up. Thanks again.

COMMERCE WEB LEARNING FROM COMMERCE TO COMMUNICATION TO COLLABORATION



SPEAKERS

Michael Palmer

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Robert A. Duffy

Managing Director, Strategic Communications

Robert A. Duffy: I have a small consulting firm specializing in communications, which means everything from ghostwriting to strategic analysis of communication needs for large organizations. What we do is advise corporations on how to reach specific audiences and supply the content, in effect, for reaching them, multimedia content included.

I work for organizations like American Management Systems, which is Mike's company, the Corporation for Public Broadcasting, The World Bank, The International Finance Corporation and several other, but mostly large organizations. Again, our specialty is communication of substantive material, and we're moving rapidly into the area of knowledge management, knowledge infrastructures in organizations. That's what our session today is really all about.

Michael Palmer: Thank you, Bob. I want to do that because Bob and I are going to conduct a very interactive kind of session today, and that applies both between ourselves and with you, the audience. So, we do have a rather large group, but I think it's a sort of nicely arranged one that we'll be able to manage if anyone wants to interject, offer some of your expertise or knowledge. I think that everyone in the group would appreciate that, although Bob and I certainly have plenty of information that we can spit at you, if that's what you prefer. But I think, in general, it's a more interesting session — it has more value for us — if we can interact a little bit. I think that's a key point.

Although we've organized it, more or less, along the format of a tutorial, it's not meant to be a tutorial. We want to hear from you. We want you to kind of redirect us if you have ideas. Some of the sites we visit will be interesting, but you may be able to suggest some others that are equally or more interesting. The thought that we're presenting here are not bulletproof by any means, so we welcome questions at any point along the line. Please feel free to jump in at any point, really.

If there's one thing any of in the industry has learned it's that change is ever-accelerating at a very rapid pace. I think that people in this room, people at the conference this week, are individuals that will be making many of those changes. So, it's kind of up to us to foster that collaborative kind of environment and see where we can go with it. That's one other point. We're talking a lot about communities of interest in this session today; this is a wonderful community of interest right here in this very session, and we hope we'll be able to do some of the same collaborative approaches that we talk about in our prepared material.

Robert A. Duffy: How many of you saw some of the statistics that were on the CNN sound byte this morning? Anybody happen to catch that? A couple of you news junkies out there. One of the latest surveys of which we know — there are several, probably a thousand by now — pegs the on-line contentions, or audience, at 25 million people worldwide. Of those, it's estimated that 66% are male and the remaining 34% are female. The age group that is most predominant is 16-34; that makes up 56% of this audience.

But the astounding [thing] to me was that in spite of a lack of standard, secure transaction capabilities for buying and selling goods on the Internet through the WorldWide Web, perhaps 2.5 million of that group, 10%, had already purchased sometimes multiple goods or services through the Internet. Just in the room, how many of you have purchased something purely on the Internet — completed the whole transaction? Looks like a lot more than 10% to me. But then again, we are a kind of leading audience in this arena, and many of us are enjoying the benefits of knowledge of this new area.

Well, today in our session we're going to talk about a number of things, beginning with commerce, the idea of point-of-sale, perhaps exchange of information, and good and services. We'll talk more about communication as we really shift away from the commerce arena, kind of broadening the definition of commerce, looking at this from more of a business perspective — ways that organizations and enterprises can leverage their intellectual assets. We'll talk a little bit at the end about collaboration, things like internal webs, ways that organizations are benefiting from an increased range and scope of communication between their key stockholders and employees.

Michael Palmer: If I may interject something... We'll take commerce as our starting point and work outward in the areas where commerce begins to depend, where point-of-sale specifically begins to depend on the exchange of information to work. And, of course, that starts with pre-sale support and post-sale support.

But before you know it, that body of information begins to expand and cover other elements such as institutional identity. The corporation that's selling these goods and services tells you who it is, what its values are, etcetera, and you can see that there's an expanding universe of information that surrounds this commercial intent at point-of-sale. That ultimately becomes a learning process for the organization. As they gather information to put out on the Web, they begin to learn more about themselves. They begin to collaborate more and they begin to see their activities in a collaborative context, both within their organization and externally with potential allies.

So as a starting point and as we begin to explore commerce, we ask ourselves, "Well, what is commerce?" Clearly, it's buying and selling — an exchange, perhaps, of monetary value, an exchange perhaps of goods in kind, but still an exchange of some value for a product, service or good. Is that all that commerce is?

Well, our premise is no, absolutely not. In fact, that form of mercenary transaction, that kind of commerce, is really a very small part of the equation. And in fact, the social commerce or the flow of information, that form of commerce is a far more important dimension of the communication capabilities and opportunities afforded by the Internet and other external networks.

Look at the background information. Who would have thought that by presenting information about your organization or firm in a very "PR fluff" kind of aspect — just rip it right out of your annual report — who would have thought that that would be an important part of a buying decision? We believe it is and that we need to work to delve deeper into that arena. The idea of the information flow is an essential component of commerce, and it carries with it some understandable dimensions that need to be explored — namely, who your audiences are.

So, if you come at this from more of a marketing communications perspective, perhaps you realize that you need to identify the audiences that your organization depends on — key stockholders, people who influence the activities of your business and influence your reputation, perhaps a whole [inaudible] who really serve as the underpinnings of your identity out there in the world as an organization. And if we look — and we will explore a few sites — we'll see that this form of social commerce, this flow of information, is really already our

mainstay on the Internet and on the Web, perhaps far more so than the pure mercenary form of commerce where I can buy a tennis racket or buy a pair of sunglasses or order a pizza.

Given the right circumstances they're all incredibly useful, but perhaps not the most compelling or important or valuable way of utilizing the Internet. So, does it make sense to start with commerce? Well, point-of-sale is certainly intriguing, but again, in a nickel-and-dime sort of way. What we're going to do today is really look at that as sort of our starting point. It's a good lens.

We're going to take a look at what begins as a very simple element and then build that into a strategic vision of the communication and collaboration infrastructure that these public and private networks represent.

Robert A. Duffy: This is kind of a backwards way of approaching it, but point-of-sale commerce does represent kind of an ideal lens look at the whole expanding universe of information on the Web. It gives us an albeit artificial, but very useful point of view to see how information and communication move out from that commercial kernel, that point-of-sale issue. But again, all of this information — the information dimension of the Web — is far more extensive today than the point-of-sale dimension. So it is still a little bit artificial. We've built a model here that you'll see in a moment evolves.

Michael Palmer: So what are some of our keywords for today's discussion? Well, commerce, clearly, which by now you feel like we've really beat into the ground. Information has a lot of meanings, but has a lot of value. Infrastructure, the underpinnings, the ways that we can conduct activities, support our business processes and communicate with other stockholders and audiences.

Knowledge, some might say, is different than information. I certainly do. There's a distinction to be made which we'll elaborate on further. But in general, knowledge is something that may be captured or stored in a variety of resources; it might be on-line as databases and digital information in your computer on the Internet, but it's also right here, in the production systems your firms have set up. It's in the relationships that you've built with outside entities and perhaps even with internal constituencies. So knowledge is a much broader, more encompassing form of information.

And collaboration, team work, common cause. How many of you are surprised to think about the Internet as a team work or collaborative tool? Anyone? I hope not. Good. Well, what is that all about? Hey, it's within your organization; it's training; it's being able to manage projects. Perhaps it's being able to conduct business from a virtual organization. Why bring 50 people across the country to work on specific products or services or projects when you can have them collaborate through these networks in a way that keeps them at home? So our next segment here is going to focus, again, on commerce.

That was our introduction overview to the concepts. I do want to take a process check right now; we have built in a fifteen minute break about halfway through the session. With a larger group like this, it's often difficult for people to be reassembled and get started again, so I'm going to put the question to the audience. Would you prefer to have a specific break and kind of hang in until that break, or just keep it open and if you have a need to go to the facilities or the telephone or something, just take off and do that? So, anyone who wants to have a break with a set time, hands up. Okay. Then we'll just keep rolling right along then.

Robert A. Duffy: You may be more inclined to do so as we proceed. Please let us know.

Michael Palmer: Well, here's a kind of beginning model, commerce model #1. This is a relatively

simple chart, but it has a great deal of information embedded in it. If you look to the top half of this chart — I guess I could move the pointer around up here — this really represents the organization, although it has gotten a bit off the side of the screen. So the top half is your organizations, your companies, your non-profit organizations, your research institutes, your universities; the bottom half, well, represents the marketplace. So this is kind of the external world at large.

And the elements that we see in the middle here are really the interfaces through which your organization will communicate with the external world. We have a fairly large one here in the middle. Of course, that's the topic, primarily, of this discussion and this week's conference — the Internet and variants thereof. On the sides we have our traditional channels, and these are the ways that people are conducting business today: telephones, faxes, FedEx, mail, human beings — imagine that, human beings — telephone support, and sales staff.

The point in including organizational information resources — of course most of you, I guess, are information professionals — is to indicate how important that is in the whole structure of running the operations of an enterprise, business or nonprofit, and the real-world operations obviously draw on those organizational information resources.

At the same time, this network infrastructure — or Web infrastructure, if you will — is also a point of interface with the real-world operations.

Robert A. Duffy: If you look today at what most of the interest has been about, there's sort of a green line; it's even visible. Most of the commerce on the WorldWide Web, for instance, has been really focused on this kind of fulfillment, and some of the activities related to ordering and processing those orders. There's a whole range of other activities and we believe the internal and external webs are going to be very efficient in supporting in organizations.

This diagram will come back to us again in several forms as we expand on it and really build into a more complete model of commerce and collaboration and communication.

Michael Palmer: Does anyone need clarification on this model as it exists, or [are there] any questions about it? It will change; it will evolve as we go on. That's the simple model of commerce using point-of-sale as the focus.

Robert A. Duffy: One of the early examples of this form of commerce on the Internet was, of course, PC Flowers and Gifts. In fact, I know that Bill Tobin is going to be presenting a session this week, and I believe he's been very successful at that. I think we're going to go ahead and take a quick, live look. As we're doing this, if anyone has some thoughts about other resources on the Internet, other URLs you might have in mind that are some of your favorite commerce sites where you're really looking at just buying and selling goods, we can certainly set up those and take a quick peek there as well.

Why don't we go ahead and take a spin, see what we've got here? Anybody need a teddy bear for their wife or sweetheart? [You can purchase it on-line at] Bears by Russ. Here's Byron, the bear from the past. Look at that, a little tag that helps us become more interested in this particular bear. It's eighteen inches sitting. Let's see a view of that, I'm interested. I think that this might make up for me being away for the week. Look at that; mmm, ooh, ahh.

Minor issues aside, it is kind of unique to be able to browse through this kind of information 24 hours a day, seven days a week. I wonder if we can go ahead and order, given that we've identified a product that we're interested in?

M: A point of information: what speed connection are you running in?

Michael Palmer: I believe this is a T-1. I know that there is a local Ethernet set up in the building, but I'd have to direct that question to some of the Internet World organizing staff. Okay, so look. We've got a search engine here. Oh, okay. Well, that's kind of an interesting value point, isn't it? [They have provided] a way to suggest some appropriate gifts, given a special date or event. Bob, did you want to expand any on...

Robert A. Duffy: No.

Michael Palmer: Were there any other mercenary commerce sites out there that you want to take a look at? Pizza Hut, Sunglasses Hut?

M: A question on that one. There's a thing up there. What's an SSL [inaudible] browser? How does anybody buying a teddy bear know what that is?

Michael Palmer: [That's a] fantastic point.

M: And a second question for this site and other sites: what's the current model for actually fulfilling the transaction? The secureness of credit cards; is that something you're going to get into here?

Michael Palmer: Absolutely, yes. What are the hold ups? Why hasn't this form of commerce exploded, totally supplanting the mail-order catalog business, perhaps [even making the] Home Shopping channel go away? Well, what is the hold up? Is it secure transactions, is that lacking? Do people care? Do people know, in general, what that's about?

We do, perhaps, in this room. [We are aware of] the ability to transmit your important financial data — perhaps a credit card number — and order information to a vendor without fear of it being intercepted and perhaps surreptitiously utilized. The ubiquitous access question is interesting. Are there enough people who have access to this forum, this communication channel, to be able to actually act out the buying impulse?

We actually think it's somewhat those, but perhaps more importantly, it is simply customer behavior. This is a social issue. This is a change management kind of issue. I mean, we in this room are sort of early adopters. We're leading-edge people that are seeing value in a really revolutionary way of communicating and interacting, doing business, buying things and selling things.

But by and large, we're a very small percentage of the buying public. So perhaps secure transactions have a concern. SSL, Secure Socket Layer, is just one of several standards that is battling in the marketplace today. I know there are many other sessions that focus principally on these issues, so we're not going to delve into them too deeply.

Is there more that you'd like to expand on with the Secure Socket Layer question? I know that you hit a very hot button for me. I'm a user interface specialist in my other spare time, and the question was, "What's an SSL and does anybody care?" I think not. This is a code. It's jargon. It's something that really has absolutely no business being in that interface, so maybe there's some improvement we can make on these interfaces to make them more user friendly, to make them more better match the audience that we're trying to communicate with. That's very important. We'll pick that thread up again throughout today's presentation — matching your form, style and content to your intended audience.

Robert A. Duffy: When we speak about these issues of secure transactions, is everyone up to speed on that? I know there are a good number of Web neophytes present at Internet World.

Do you need some background on that?

M: I have a question. Where should SSL go, or secure transaction? [Where should] that kind of concept go if it's not in the user interface level? So you're saying people coding the [inaudible] shouldn't worry about that. Where should it go?

Michael Palmer: The question is, where should those issues appear? Our premise is that they don't need to appear in the interface because the audience doesn't know what they are and couldn't care less what they are. They're a benchmark task.

What they're trying to accomplish is to purchase a good, product or service through the Internet. So SSL, and any of the other secure transaction mechanisms and standards are really background, hidden from view. The user should never know about them, see them, hear them, feel them, touch them or realize they're even happening. It's part of the magic that makes this whole communication channel work. Every time we have that kind of element in an interface, it adds complexity and scares people and can have the detriment of turning away perhaps a segment of this buying audience that in fact we may be trying to reach.

I see another hand in the back.

W: [inaudible] your phone conversation will be eavesdropped on when confidential information is being given out. I honestly believe that the average customer has no awareness of those issues. They don't realize how their privacy can be compromised.

Michael Palmer: Okay. So there's an issue of, again, not misleading potential customers and drawing them into an environment where they could be harmed in some way. So where would that information go? Well, perhaps not to be presented as an SSL but to be presented as a means of securing your important data or information or transaction from prying eyes.

Now, there's some sense — and I'm going to be a contrary here for a moment — that I have understood the security issue of purchasing small ticket items such as flowers and gifts and things under ten thousand dollars, say, on credit cards. There's a sense that really the concerns over security and "Gosh, someone can tap in and steal my credit card number," are grossly over-exaggerated, perhaps even manufactured by organizations and entities that may benefit from scaring people about the security issues.

For instance, how hard is it — to impress some technical people in the room — how hard is it to tap into a TCP/IP data stream on the Internet? What do you need to have? You need some packet sniffers and you've got to have an access port to get into a network center somewhere and feed off the routers and the bridges and whatnot. You have to have a very high level of technical sophistication to do that. How hard is it, on the other hand, to pull your van up to the local telephone pedestal outside a mail-order house and record a week's worth of telephone conversations where people are offering their credit card numbers day in and day out? I would argue that that's a far better understood technology and a heck of a lot easier for people to tap into.

Credit card slips, there you go. Listen, I had a credit card stolen. We didn't realize it was time for the new one to come in the mail, and of course we didn't realize it hadn't arrived until three months later. We had a maxed-out credit card with charges all over the country.

Someone went on a real fun buying spree. Was I liable? No, because in our agreements with all of our credit card issuers and providers we're protected at a fifty dollar level — at the most — from unauthorized charges. Those are very clearly defined as those for which we have not signed and have not authorized through a physical means.

W: The point that I'm trying to make is that [inaudible] is basically provided by regulations in the banking industry. You'd have to check with the consumer. But there is no such place to protect the consumer on the Internet.

Michael Palmer: But if you use a credit card you are protected.

W: [Inaudible] possibly is one of the avenues for doing that. But if you started to look at other avenues, bank accounts and things like that on the Internet, there are other issues that consumers are not going to be protected from in that environment.

Michael Palmer: Right. What if you could make [an] electronic fund transfer?

W: With an ATM card, you're protected by banking rules and regulations.

Michael Palmer: So what do we think? Does this sound like an issue that is an important one for people to follow up on and perhaps work to have similar restrictions, regulations and legislation enacted to protect these kinds of transactions? Anybody want to offer a thought?

Robert A. Duffy: The gentleman up there.

M: The point is, you want to [inaudible] You need to know that [inaudible] are there. People are reading about it in the media. The media is also coming out with stories about the Internet, and a lot of security experts would argue that the same laws we have protecting telephone conversations and credit card transactions are easily applicable to Internet transactions.

Michael Palmer: Okay.

Robert A. Duffy: That does go to the issue of customer behavior and customer trepidation about using the Net. In my survey of the media coverage of this issue the press are, by and large, alarmists. In fact, they don't press the points that you suggest, true or otherwise. I'd like to see more coverage in the press to indicate that there are greater levels of security on the Net today than the alarmists' voices would have us believe. But until that happens, the public reaction across the board is going to be generally shy.

M: [Inaudible] *USA Today* poll today, and the newspaper said that 52% of the population of the U.S. believe that the computer security will be better or much more improved than it is today in the year 2000.

Michael Palmer: These are good. And perhaps by that time the trepidation level will drop, and we'll see more than 10% of the available on-line community engaging in transactional commerce. We're spending a great deal of time talking about some of the issues that may be roadblocks to a widespread adoption of these kinds of commercial transactions on the Internet. That would — if we continue to spend that time — imply that we believe that mode of transaction was the most important mode there is on the Internet. In fact, our premise today is that it is not; it is a very small portion of the value to be had through this revolutionary communication medium, and we're going to move on to more collaborative and perhaps communication-centered processes.

So here's our commerce model #2, which you will see is largely the same as commerce model #1. Down here on the bottom you see we've added potential customers in addition to

customers. This would be an audience of people who don't know anything about our organization, our firm, our products, our services, our stance or our research, and would like to know more because they perhaps want to — what? Buy from us? No, maybe not. Maybe they want to collaborate with us. Maybe they want to build a relationship with us.

Up in the top we see that the point-of-sale has shrunk. Obviously, we're again moving away from that concept of mercenary commerce, this being the overriding reason for being on the Internet. I've added some elements here to the real-world operations, namely pre-sale support. How about if we can communicate our catalogs, our data sheets, our specifications? We may not result in a transaction happening on the Internet, but does that matter? I think not.

We may instead get requests for demonstrations or perhaps inquiry response. Now, you'll notice that these sort of aqua panels on the right and left — post-sale support and pre-sale support — actually transcend the network infrastructure, which would imply a communication with the audience through the Internet or through a network of some kind. But they also exist in real-world operations. Today, in most organizations, these processes are being carried out and conducted in the real-world, utilizing traditional channels such as people on phones, people with faxes, FedEx, paper documents and contracts.

The help desk and follow-up is kind of unique. Actually, many of these we could probably put into a time dimension and look at how different types of organizations will adopt these particular types of processes as network-based processes, and we'd see that obviously the computer industry is going to be the first.

In fact, how many of you are from a computer product firm — software or hardware — in the audience today? Okay, well over half. Of you, how many of your firms are already using the network channel to provide installation instructions, technical support, or maybe just e-mail for help desk type issues? Keep them up for a second. So about half of the individuals of the computer products and services firms. Of the half that are not doing that yet, are you planning to? I don't see any hands. I hope so; I can't imagine a better marriage between an available audience and the need for information. Again, perhaps it's not transactional commerce to buy the product, but about using the network channel to get product upgrades.

I was astounded to see that the Sun Service division was saving \$1.3 million a month in shipping and personnel costs related to preparing user software upgrades because they are now distributing those over the Internet, as opposed to mailing out physical tapes, cartridges, floppies, whatever. They're a big company, but that's still a big number even for a big company. There are a lot of other processes that dovetail very nicely with the current capabilities — security issues aside — and with the existing Internet.

Robert A. Duffy: Is everyone with us in terms of how this model has evolved a little bit? It's expanding outward from that point-of-sale function to include corollary information that has to flow to customers. But not just customers; potential customers as well. So there's a new wrinkle here, the notion of bringing customers on board, of selling them in effect. That transaction is an information transaction. It's a relationship, and these are words that are going to recur in our discussion.

Michael Palmer: So if you're going to clinch the sale — again, we are still in the commerce section, we're talking about selling a product or service — we need to describe what we're offering. We've already seen this. What do product descriptions plus pictures plus ordering information equate to in the real world? Catalogs. We already looked at one, PC Flowers and Gifts, an on-line catalog.

Now we're going to take a look at another site, L.L. Bean.

Robert A. Duffy: Of course, in the mail order channel, L.L. Bean is the granddaddy of the catalog channels. Here is its Net presence, and we've already drilled down into the interface a little bit to save time.

If you click on "Apparel and Accessories," you're presented with another list of a panoply of possible choices. We'll do "Fleece Jackets," and you'll see this is remarkably like a print catalog presentation. What's up with that? I thought the Net was the land of icons and image maps and sparse words. Suddenly we're back in the universe of textural coverage. That's one step. If you try to order from L.L. Bean you get an order form where they say, a bit disingenuously, "We will not accept orders via e-mail due to our concerns about the security of your information," as if everyone out there, speaking of customer behavior, wants to order by e-mail.

But L.L. Bean is saying, "No, no. Not secure yet. Let's do it through traditional channels for a while until we can protect your interests." Well, of course, that's a marketing pose in a way, and they're making the best of a bad customer attitude situation here. Mike, did you want to comment on this?

Michael Palmer: Well, I believe there are some other features. There's a park search that exists. Let's touch on that very briefly. One of the core values of the Internet, and the WorldWide Web of course, is the free exchange availability and provision of information as a service. L.L. Bean is being a responsible network citizen in that sense by offering the park search feature.

Robert A. Duffy: Let's defer that for just a second because there's one other feature I think that fits in before that, and that's the background information on the company. The [park search] is something we're going to look at in a moment, but we come from the realm of the catalog to the realm of institutional identity. They've got this Web server; they have the bandwidth to satisfy customer inquiries; so why not talk about the nature of the company, the history of the company?

We're moving out very rapidly from a notion of sales support to a broader concept of that relationship with the customer — supplying identity. The next step of course is, as most of you know, to build prestige and convince the customer of your value in their particular community, in their particular universe. That, I think, is where the lifestyle tie into the park search service comes in.

Michael Palmer: The park search service is not only, as Bob pointed out, in keeping with the core values of the Web. This free provision of information is also a hook to an interest group, a special interest community — perhaps individuals who enjoy recreational activities. They go to national parks to pursue many of these activities, and here's a way that L.L. Bean can tie into some lifestyle mechanisms to keep people coming back, to keep people interested in building a relationship with L.L. Bean. Customers are not just doing a quick sale and getting a sweater, but building a relationship.

Robert A. Duffy: I think I'm in a loop here.

Michael Palmer: Did we lock up?

Robert A. Duffy: Yeah.

Michael Palmer: Well, suffice it to say, for those of you who have not explored this, it's a very nice compilation of state park information which is accessible through all of the different

keywords pertaining to activities like kayaking, camping, tennis, hiking, boating and canoeing. It is also accessible through geographic location. I want to go ahead and go back and maybe you can reset that.

So the issue of identity is important because people, organizations — any external entity who may want to develop a relationship with you, whether it's a buy/sell or collaborative venture, whatever — are going to want the context to understand who your organization is, what you do, and how that relates to the marketplace at large. What are your activities, products and services, your core competencies, the things that you're particularly good at — special things that set up apart from the rest of the world?

Look at this. "Mission and Values". There's your annual report; but those are important elements of identity, their history — and perhaps most importantly — their view of the future. Now, there's been a lot of concern in my industry — I'm in management consulting and systems integration — a lot of concern in my firm in particular, with presenting information about our view of the future, because this is kind of like saying, "Well, gee, if we give it away then everybody's going to know, and our competitors are just going to get right in and copy it and see it and use it."

These are issues that are being navigated in organizations everywhere. Today is anyone involved in selection of content to present through these Internet channels? I see quite a few hands. Would anybody like to offer comments or maybe have a similar war story in terms of knowing you'd like to present information, but having restrictions placed on that because of confidentiality concerns or worries about competitors picking that information up?

If it hasn't come up, it will soon, so be prepared for that. But every one of these issues that builds an image, an identity — a feeling of warm fuzzies, if you will — about the organization that I may be engaging in a relationship with, these are all crucial elements and play a very strong part and role in impressing an organization to join or do business with another organization.

So Web commerce seems to be more about communication than it is about point-of-sale transactions. Succeeding and building image and identity is more about how you communicate, perhaps more than what you communicate. They're very intertwined and very important. There's really a marketing communications viewpoint that's very important to bring and superimpose on some of the existing kind of way-cool Internet Web surfer issues. We have a question in front.

M: [inaudible] example we just saw was a great example of cutting the communication line. I'm sold on the company. I'm sold on the product. I want to buy the boots. What do I have to do? I have to turn off my computer, turn off my modem and pick up the telephone to order them. They've just cut the communications off.

Michael Palmer: Well, let me turn the question out. I admit, I experienced the same frustration, but let's go on the other shoes and say, "I've just invested 15 minutes in learning about the product and perhaps selecting it, comparing it to the competitor's products. Now I want to buy it." It's a roadblock, but is it a concrete roadblock? Maybe not. Maybe it's a little barrier I can walk around.

M: I guess [inaudible] shopping through my catalog for an 800 number instead of [inaudible].

Michael Palmer: Right, and you know they'd rather not do that. I think they'd rather not cut the communications line. They simply have to because of their perception of the public perception. This gentleman over here had a point.

M: If you're on the Internet, I think browsing around [inaudible], but most of the time you get the catalog. It's much easier to do it that way, with the catalog in front. The other thing I noticed here too is the catalog that gets delivered to your door is far more [inaudible] on the computer screen. It's high resolution. It's quicker to access. You might find other things as you're going around.

Michael Palmer: That's an interesting observation. It really leads into a discussion about the premises that the printed catalogs, the traditional means of communicating with the catalog, is in essence, easier to use. It's higher resolution, it has a broader bandwidth of information, it's more comfortable, and perhaps a better mechanism compared to the on-line services.

We all know that there are a lot of technical issues involved. Everyone does the best they can in presenting information through a narrowly defined standard, and there are ways of breaking out of those boxes. We'll soon have bandwidth on demand and gigabyte per second networks to our wristwatch, but it's going to take time. Right now, the catalog in print is a very different form of communication and can be leveraged because of its advantages in certain ways. Now, let's think, let's do a thought experiment. What about leveraging the on-line catalog in a way that offers value to the consumer that you can't get from a catalog?

Specifically, I'm thinking about a collaborative venture where, perhaps L.L. Bean teams up with — my God — their competitors, selling other sporting products and other goods related to their markets, so that the consumer has a one-stop point of access to come in and do perhaps a search of 30 catalogs worth of products and goods all at once. I certainly get frustrated. How many catalogs do you get a day? The pile of catalogs actually exceeds — for me — the pile of trade journals that come in.

Robert A. Duffy: It's the print catalog we're talking about. This may be a generational fixation, believe me, but tactile satisfaction. How much better does it feel to have a book, a magazine, a sumptuously-printed product in your hands than to be on-line? Again, this may be more characteristic of 35+ individuals than 20-somethings. Your laptop doesn't fall on the floor when you fall asleep.

Michael Palmer: And how many of you use your laptop to shield your eyes from the sun when you're walking around the beach? So there is a great difference between the different media being used to communicate, and perhaps this is a user interface issue because today's screens, today's mouse/windows interface, is limiting. It's very old and it's served its time, but we're ready for a more pervasive, less intrusive kind of interface, which we already have in many of these printed materials. The woman in front.

W: I think what we're looking at is a very big phenomena because I think that print catalogs and on-line catalogs are going to be competitive in many ways. What's going on in the direct marketing industry is the cost of paper, the [inaudible] environment, the people are getting sick of getting this in terms of throwing out paper and recycling. You've also got the increasing cost of postage, which is causing a lot of catalogs to go out of business.

And the other thing that on-line catalogs are the up-to-date [inaudible] because as the postage and paper go up in price, they're not going to be able to send out those updated.

Michael Palmer: So despite the limitations of the on-line presentation, perhaps there are other value points that we can leverage: timeliness of information, being able to do spur-of-the-moment sales. How about doing real, personalized selling? What about gathering information

about your potential customers so that you can suggest cross-sales, so that you can really target a range of products that will be very in line with someone's interest? It's hard to do that with catalogs because you'd have to print 25 different versions of your catalog.

W: [inaudible]

Michael Palmer: What's your cycle time on printing that media? You're right.

W: [inaudible]

Michael Palmer: The gentleman.

M: We were talking about L.L. Bean's channel of communication, and I noticed that on the L.L. Bean screen there were two options underneath, by telephone or by computer with word processor.

Michael Palmer: The thinking there was one of them was an *Acrobat* file, a portable document format file which you cannot edit, but you can certainly download and print a very precise representation of the order form that you would find in the catalog. The idea was that you would print that out, fill it out by hand and perhaps fax it or mail it back.

The form for using a word processor was like a word document that you could actually edit the text in. So you would put and type your own order in, which I think is a great value to L.L. Bean — more so than to the consumer. I don't know about you, but I probably find it faster just to scribble down the numbers and send it off than I would to get into my word processor, type it out, save it and then e-mail it. Those are barriers, definitely barriers.

W: [inaudible]

Robert A. Duffy: In other words, even though there must be other ways to add value to the community by doing that.

Michael Palmer: Audience, what do you think? Does L.L. Bean miss the point? They're just regurgitating their catalog. They haven't taken advantage perhaps of some of the new functionality and capabilities. Your order history —you know that company is storing it. How about if they let you see it, too?

M: [inaudible]

Michael Palmer: More in-depth information. Can everyone hear what this gentleman is suggesting? More in-depth information is available on-line than perhaps you could ever hope to print in a catalog because you'd have a ten thousand page catalog.

So perhaps the catalog is the teaser that draws you in to interest, but on-line you have a much broader range, a more complete universe of information about not only those products, but also the company that I want to enter this relationship with.

M: They don't want to take your order on-line. I'm actually turned off by this company.

Michael Palmer: That's the second comment. You guys are all up in front. Anybody in back have that feeling? A couple of people.

M: [inaudible]

Michael Palmer: Fantastic. So we use the on-line communication channel to build a group of interest. "I want to be on your hiking list so I can learn about new products and services in that arena."

Robert A. Duffy: And you're beginning to move into the realm of a collaborative mode of customer relationship at the same time you're extracting information from that customer, building a profile on that individual and creating a kind of platform for "customer intimacy," as it's called. Some of the points that Mike raised, where you know that customer's buying habits — and this may be a little intrusive on privacy issues — you know that customer's buying habits when he or she comes on to make an order. Then you suggest related products based on his buying history.

Michael Palmer: So building that sense of belonging in the special interest community that perhaps L.L. Bean could create would be a key factor in convincing individuals to enter into a relationship on a long term basis with that organization. Urgent question.

W: [inaudible]

Michael Palmer: Interesting. Kind of like Levi's system where you can have a custom-fitted pair of jeans ordered. There's actually a couple of laser-ranging systems that let you walk into a fitting room, and the laser beam shoots around you to get important measurements. The next day, by express mail, your perfectly fitted pair of Levis comes to you. So customization of product is another way of enticing people.

W: I want you talk about [inaudible].

Michael Palmer: The two-way communication.

W: Yeah, the exchanging of the information.

Robert A. Duffy: To be able to visualize it.

M: I'd also like to add that I think commerce on the Internet is much [inaudible], that product all over the world and they're less concerned about getting the information out to everyone.

Robert A. Duffy: Empowerment of the individual in a way. Sure.

Michael Palmer: Should we take one more question and then...

Robert A. Duffy: Yeah, take one more and then we'll break. Go ahead, sir.

M: I think people who work here are unwilling to put their money into on-line [inaudible] should turn to the left side and say "here's what you got, X number of pages." It's kind of penny-wise and pound foolish from my perspective, because I work for a company that does a lot of direct marketing, and if we could go on-line with all of our printing it would be unbelievable.

The problem is getting people who are used to doing mailing even though the [inaudible]. Let's put the whole catalog on-line; let's put the coats and the jackets so that you can see them at 360 degrees because you're paying money. Dealing with internal stockholders on that is really the key to reach the critical mass where you do have something on-line that really does represent your product, as opposed to saying, "Gee, we've got our catalog on-line," and you go there and there's maybe 5% of it there.

Robert A. Duffy: Institutions are amazing; some institutions are amazingly easy about spending six figures through a familiar channel even though the return on that investment is not clear to them or not consciously clear to them. But they fight like crazy and resist new modalities. That's really true, and I think that's part of institutional inertia. In another way your question almost sounds like a setup, because you're talking about tokenism. My personal opinion is that there's not just tokenism in catalog publication on the Web, but pretty much tokenism across the board.

The next site that we're going to visit, I think, is a case in point. Coca Cola, where they've given a certain amount of big bucks, I think in this case to their technology and Webmaster establishment to set up a site. It gives itself, at least on the surface, to a very specific audience and it's not about point-of-sale, but it is about selling in a way. Why don't we leave this up, as kind of the coda to this section.

Let's take about a five or ten minute break if you want to do so, and then we'll come back and look at the Coca Cola site and some of the communication modalities they use. Thanks.

[Tape change]

Michael Palmer: [In the first half of the session, we were] looking at the idea that identity, image building and communication were some of the more fundamental elements and value points to be exercised on the Internet. Now we're going to take a quick look at the Coca Cola site where, if we read some of this — I gotta be honest, I wasn't nuts about the idea of a Coca Cola trading post. It's like, "Welcome to our site. Buy stuff." This is clearly not a traditional corporate sales site, is it? What do we have here? "Welcome to our trading post." You see sports and entertainment. Look at that, every time you go you get something about the Coca Cola company. Let me go back and see what happened there.

The "World of Coca Cola Pavilion." Look at that. I always get this same tip here about the Coca Cola company. They obviously want me to learn more about the Coca Cola company. "Welcome to the business end of the site. This is the place to look for a message from our Chairman, or an update on your stock. Just click on any of the vending machine's hot spots."

That's interesting. Let's see here. We got stock and earning. Look at that. New York stock exchange information... This is clearly not a product solicitation. "Our Mission And Profile." My goodness. So there's a lot of information here I guess you wouldn't traditionally expect to find in a kind of way-cool Web surfer target site, although that front page sure looked like it. What do we have down here?

Robert A. Duffy: Did you note the lead-in to the mission and the way higher-ups?

Michael Palmer: Yeah, where was that? I didn't find that.

Robert A. Duffy: Near the business end of the site. Right here on this page.

Michael Palmer: I've lost it. I couldn't find it. Let's go back up here and go through the front door again. You know what? I think this page changes routinely. Anybody notice that?

Robert A. Duffy: As of yesterday they had a page there — I'm sure we could find it if we searched around — a page that said, in effect, "this is the page that the poo-bahs or the higher-ups insisted on our having here, so we're putting it here anyway."

This is the kind of disingenuous pose — a marketing pose — that we're talking about when we address the issue of communication and communities of interest, because they're going right for a 20-something Net surfer audience. You can bet that the Coca Cola management, when they approved the expenditure to put up this very expensive Web site, did in fact insist on putting elements like corporate mission there. You'll note that the tone of the corporate mission statement, by the way, is very pompous in the grand tradition of corporate mission statements. It's totally out of tone with the rest of the site, and that's because they insisted that it be there, I'm certain.

Michael Palmer: There's a little bit of opportunity for feedback. Several of you who we spoke with during the break pointed out that you could have taken advantage of this channel to obtain information about your customers. Look at that — two of the muckity-mucks of the Coca Cola company. Somebody suggested, "Tell us what you really think." You can help route your comments by using keywords like "Diet Coke," "women's sumo wrestling," etcetera. Well, who buys a lot of Coca Cola? There you go.

Robert A. Duffy: They're not dumb when they do it like this. They know that there's a significant market segment to be reached and probably this is the — they get the biggest payback from focusing on this market segment, because how many people in upper demographics regularly surf the Web and look at consumer companies like this? Not many. Did you mention this, Mike? The trading posts?

Michael Palmer: About the classified... I was just getting to that.

Robert A. Duffy: Well that's another community of interest, but it's kind of tucked into the nether reaches of this infrastructure here. There's a very great deal of activity among Coke memorabilia collectors, so they put up a section to appeal to them. In fact, trade the memorabilia on-line. This is a worthy attempt to reach that community of interest, but it simply strikes me that there's probably very little commonality between the way-cool Web surfers and the collectors. I may be wrong. And the collectors of Coke memorabilia — bottles from 1935, the classic year in Coke bottle, 1935 — I just can't imagine the typical Web surfer being interested in that kind of thing. That's a community of interest that's served out there.

M: [inaudible]

Robert A. Duffy: Oh no, no. I think it's very well done, but I was simply pointing out the logical disconnects in it. They all point to a consistent market focus, and it is very well done. I suspect — well, I'm almost certain — that you'll see a broadening of the communications base in sites like this and others. We'll see as time passes and there's more and more widespread communities.

Michael Palmer: As a rather large organization flying the Internet waters to communicate with their constituents, they're taking advantage of some of the techniques that are more

communication-related than commerce-related. So that's really our premise. They're building communities of interest. They're presenting image and identity. They're reaching an audience and they're tailoring information to their target audience — doing some things that are not purely commerce-related, although I guess it is somehow related. It certainly helps sell more Coke.

So with that, we're going to move into the communications section. Having exhausted commerce and perhaps spent a little bit more time on that than we might have otherwise wanted, let's talk a little bit about the audiences here to the Coke site. Who are they targeting? Well, people who are young and hip, the hip cybersurfers; people who perhaps are looking for a diversion as opposed to a hard sell. Anybody think you could find the Coca Cola formula there if you searched hard enough? That might be a little too confidential. Looking people who aren't wowed by the trappings of authority... Here's the place where we've got to send info to the mucky-mucks.

Robert A. Duffy: That's kind of a tactful way of putting the attitudinal sector there.

Michael Palmer: And then here are some of the special interest communities. As Bob was mentioning, perhaps there is a disconnect there, although you can consider that as an attempt to have tailored information spaces within that Web presence that were targeting two different audiences and segmenting it.

It might be better to build the interface in such a way that there's a clear path of entry into that segment, however. And this, of course, if I can sound like James Earl Jones, this is marcom, and that means marketing communications.

That brings us into a whole new realm. We started with point-of-sale, pre-sale and post-sale support. Now we're dealing in the realm of using information in a commercial sense to support the economic health of the enterprise — to sell. It's a pretty easy transition when we go there from getting lifestyle warm and fuzzies, which is really what the Coke site did to its segment of audience. It makes them feel like they belong in a community. They are providing useful information that's either geared to lifestyle like the L.L. Bean site, for instance, with its park search utility, or even more serious areas of interest.

There are people, organizations and professionals out there who want to use the Net and who want to use the Web to get information that's useful to them and valuable to them in doing their jobs. That's what we mean when we say that other segments are joining in. The different organizations and constituents that we're going to represent here are kind of a new audience. This is when you take it beyond the hip cybersurfer audience, take it beyond the rampant buying impulse people who want to buy that pair of sunglasses right away today and look at a very significant business application for this communication aspect of the external network.

For example, securities analysts. You know there are some sensitivities and that you have to be careful about the type of information that you might try to specifically target to this audience. But it is important to realize that this is a very influential and important group of people that you will reach, perhaps some opinion leaders, if you will, who in a very small group wield a great deal of influence in terms of positioning your organization and being leaders — I guess thought leaders — and describing your firm and its value in the marketplace.

Robert A. Duffy: Yeah, that's a key. That's a buzzword, but it's a key term, the notion of opinion leaders. And now we're moving beyond marcom even, into the realm of, for lack of a better term, public relations. But it's really about image building — transmitting your prestige as an enterprise to broader communities of interest. That's why these guys and women, media and

securities analysts, play such a big role in that. And they're coming on the Web; they're doing research on the Web.

Other sectors in there would be professionals. That's a catch-all, but what we mean by that is merger and acquisition scouts, analysts within corporations that are looking for alliances with other industry players. Those are just two examples, but I think if you thought about it, you could think of very many others in that same category. Institutional investors and investors in general — but institutional investors in particular because they carry more bang for the buck per transaction; researchers, either on campuses or people who are writing books, whatever. There's a great deal of value of expanding the information transaction in your Web space beyond marcom into the area of legitimately useful information.

Now, there may be a spin favoring your organization on that information, but it's still truth and it's still useful to the generally intellectually curious.

Michael Palmer: And again, some of the elements are features of new communication channels that make it so compelling for say, distributing catalogs, that make it even more compelling for distributing an organization's intellectual capital — information that backs up its identity and image, presents information about its vision mission and where it's going, and provides credentials perhaps by publishing research findings, etcetera in that sense.

How would you send ten thousand copies of your 50 page research White Paper out? Very expensively, of course. But why don't you make it available on your Web presence and maybe send out an e-mail to people who might have expressed an interest in learning more about your organization?

Robert A. Duffy: How do they do that today? If any of you read *Information Week* or *Computer World*, you'll see the ubiquitous full-page ads from computer vendors which say, "If you want our free White Paper on managing clients over on the enterprise or whatever, call this 800 number." And they're spending a lot of money on communicating ostensibly factual and useful information to traditional print channels. Mike is suggesting that the Net is a collateral channel for that.

Michael Palmer: Here we are back to our model of this communication process taking place. The principal changes from our last view in the communication model here, the point-of-sale, has diminished to almost a dot, really going way beyond that. We still have pre- and post-sale support operations taking place both through our network infrastructure and through the Internet channel, as well as through traditional channels.

But we've added some things on the bottom. We've added a new group of opinion leaders for the new audience members that we're trying to reach — industry allies, people that we want to collaborate with, perhaps, in our markets. And we've also added this thing called organizational knowledge, which perhaps Bob would like a stab at.

Robert A. Duffy: This is the simplest way we thought — or not the simplest, but perhaps the most useful way — we could express the concept of the intellectual capital of an organization. Think of it as the value of an organization's experience and operations over time. It becomes its knowledge base. There's a growing discipline in managing organizational knowledge. As you can see, it draws on — I hope you can see that we intend for it to draw on organizational information resources, on real-world operations, and to both draw on and be expressed through the network infrastructure. So when I refer to factual and useful information published by a commercial enterprise, I'm really talking about some of that institutional knowledge that we, as an enterprise, are trying to communicate to our diverse audiences — customers —

through opinion leaders.

Michael Palmer: This was helpful to me for comparison purposes, to think of organizational knowledge as the collective intelligence within our organization, made up of its people; the thoughts and the processes in our minds as members of that organization. The systems and processes we have in place are our manufacturing systems, perhaps our order fulfillment system, the way we handle incoming customer support inquiries or technical support operations, and distribution.

Organizational knowledge is all of the [company's] activities, both real-world and as embodied in our corporate management information systems. The organizational informational resources are really, to me, translations of organizational knowledge that take a form. They're a database. They're an application that helps our accountants keep track of our profit and loss. They're our print media, such as our annual reports. These are all elements that we've drawn out of the organizational knowledge.

Robert A. Duffy: And it evolves, and it changes, and it's very, very difficult. And perhaps more importantly, it's very, very expensive to capture in any comprehensive way. What we're talking about here is getting as much of it as possible and using the Web as a channel to get that organizational knowledge. Of course, it has to be kind of packaged. It has to be collated and packaged in effect. But putting it up on a Web server as a means of enriching the information channel — again, remember we started with pre-sales and post-sales and went to marketing communications. This is a much broader information channel now. And in effect, if you can get past the terminology that we use of organizational knowledge, it's already happening out there.

Michael Palmer: I think that another distinguishing feature that helped me understand the concept is that organizational information resource really, in a sense, withdraws from the bank account of organizational knowledge. The deposits that an organization makes in that knowledge are really the learning that takes place in the organization — learning about the marketplace; learning about the customers, the allies, the relationship building; personal learning and knowledge; recruiting, hiring and human resources. So that's the way that the organizational knowledge base is replenished, and there are some wonderful management texts on the whole subject. I believe discipline is one of the principal tombs in that arena related to the learning enterprise.

I think that the Internet channel, it's safe to say, is a way for organizations to accelerate and less expensively capture that organizational knowledge, and then leverage it by reusing it perhaps and making it available, both internally and externally, to the organization.

Robert A. Duffy: As we move into the collaboration segment, you'll see how that can, in fact, happen in organizations.

Michael Palmer: So the trend of all of these conjunctions of concepts and realizations, and understanding the value of this channel, is that the Web information available is becoming far more serious, and nowhere is that more obvious than the services sector.

Robert A. Duffy: What we should have said, before we show this slide, is “follow your impulse.” Groan or cheer based on the next screen that comes up, because I'd really like to know what your response to that is. Okay?

Michael Palmer: I heard one clap and one sigh.

Robert A. Duffy: They paid big money for that.

Michael Palmer: That was either because it's time for the session to be over, or...

Robert A. Duffy: We want to look at IBM very briefly because IBM does do a good job in this regard of broadening the information channel. So why don't we just jump in to their space? This is their welcome page. And what I want to draw your attention to first of all is the journalistic periodical model that they use.

You can read about their presence here at Internet World, if you choose, but they have a little bit more substantive stories there as well. These are not plain and simple news releases; they're massaged a little bit, and they're quite good. Now, there's a straight text story, but they use a far richer mode in other stories.

For instance, they're using hypertext, again reaching out with this notion of community service and communities of interest at the West Virginia public school system. We won't go there, but that's a leap out into cyberspace. And they use a fully illustrated — or somewhat illustrated — page in another, more marcom-oriented story. So if you wanted to find out about their activities, that's one good place to start in the IBM space.

Michael Palmer: It was interesting to me to see that the organization with the dateline banner for October really paralleled the kind of monthly newsletter, if you will. And like the Coca Cola site, things change very frequently.

Robert A. Duffy: Yeah, if the Web space is started with the concept of a billboard... Commercial Web spaces, I think, are rapidly moving to the periodical model where you'll have a dateline. Whether or not a lot of the material changes I think is less important than the perception that these sites give that the material is changing. You change a lot of the materials at the top levels, but keep the solid infrastructure elements there. IBM does a great job.

Michael Palmer: In a sense, that — the delta, or the change from one representation to another — is going to imply a change in organizational knowledge, that the organization has learned to stay in its leadership position, perhaps, in the marketplace. So this is a very good way of representing that the organization is continuing to learn and grow and hopefully entice outside entities who want to collaborate or place their trust in that organization.

Robert A. Duffy: More likely the latter, in IBM's case. Here's one interesting point; the stretch category that they have here. Organizations that have the means to do collateral marketing communications campaigns are beginning to use the mixed media resources that they developed there in their Web spaces. MCI is a case in point, with the Gramercy Press campaign. There's an actual Gramercy Press site on their Web space.

Here's IBM's version of their very clever campaign, in my opinion, "Solutions For a Small Planet." And you can get to storyboard versions of the individual commercials. It's interesting to me, as an Irish-American, that IBM is not very politically correct in portraying the only animal on this board. [What they have used] to portray these national identities is a sheep. That is, of course, the Irish commercial. The rest are all real human beings.

But you'll see this is storyboarded here. You can get the video; we're not going to. We don't have the help wrap-enabled here, so we can't go out and get that. But they have the script in the original version. The original version is very dialectical. It's not Gaelic, but you can even, if you choose — again, this reaching out to the outside world — you can go to other Irish

resources. You can go, if you're following the channel down to the Tibetan Buddhist portion of the campaign, to similar resources. You can learn Gaelic, visit parts of Ireland or whatever. Again, this is the company kind of reaching out to diverse communities of interest.

At the same time they are providing a putative service to Web surfers, but they're not fronting that as many of the early pioneers in Web space development did. They're tucking it back and attending to their corporate communications agenda up front, but doing it in an entertaining way.

Michael Palmer: So what we find in the Big Blue site is a return to the more core values of the Internet communication channel in presenting identity elements, image elements — things that are really informative communication. Naturally, we want to see more of the service elements available as well. They're a little short on the collaborative venture, but then not every organization has evolved into the full-scale, bi-directional communication that we believe is the kind of killer application here. But they certainly covered most of the other bases, and shied away from the pure kind of rush to commerce.

Robert A. Duffy: When you get a chance on your own, look into that IBM site and see how many of those elements are actually covered. We sort of rushed through it, but there's a good deal of serious material on their technology and on their community relationships as well, if you look for it.

Michael Palmer: So what are some of the reasons that IBM uses some of these techniques? Well again, to build an image, an identity, and to be a leader in providing this kind of information. The result is, overall, a very comprehensive look at the organization at a level that is representative of a very complex information universe.

I think we had a couple of comments earlier about interactivity being important. Nowhere is that more important than on the interactive services, because people expect to have at their disposal huge volumes of information, not just a couple of narrowly defined, pretty slick pieces. They want to have access to everything. They want to get right down into the heart of your organization. That's going to be a major challenge, managing the value of opening a broader, more open channel of communication with the external world through these mechanisms. How far do you go? How much do you open? Do you provide access to your internal on-line accounting systems? I don't think so. Do you provide access to your last 20 years of financial data and provide your quarterlies the day that they are submitted to the FCC? Absolutely.

In fact, it was kind of interesting to note that my firm actually was able to distribute the annual report for 1994 about three weeks early by distribution on the Web. We didn't have it back from the printers yet. That's very helpful to us. The information was ready to go, blessed, combed over, had gone through 17 different levels of approval and was wordsmithed by a host of thousands, and boom — it was finally out there on the Web a couple of weeks before it could even be sent out to our key constituents. So there were actually many institutional investors and other organizations and perhaps opinion leaders who were able to access that information through the Web.

So we're going really beyond purely marketing communications as we go on our communication chain to presenting real corporate know-how that is intellectual capital, which again, to refresh memories, capital is knowledge and experience embodied in the products and services offered in the marketplace; the systems that support those; the processes of — I mentioned a few of those before — customer service fulfillment, shipping, receiving, all these sorts of things; your research activities and your look to the future, what's your eye to the

future. And particularly in your human resources. We the people that make the organization are organic databases, I believe.

Let me interject something on human resources. The conventional wisdom or the old paradigm of Web spaces tends to dehumanize the space, and you see very few documentary photographs of people or information about people. But now corporations are beginning to do more and more of that. It's been a long time coming. It's a little surprising to me because in the other communication channels — in the print channels and in the television marketing communications channel — companies are very quick to promote their human resources and the notion of the people that work for them. IBM does this, and now a number of the other major companies that have fully elaborated Web spaces are beginning to bring in selected photographs of people and profiles of the people who work for them. To me, that's a very valuable human tool.

Where are the people on the Internet?

Robert A. Duffy: Look around. They're hard to find.

Michael Palmer: The list goes on and on. Everything that could be said to define an organization — but most importantly, that organization's relationships with the marketplace, with customers, stockholders, investors, capital markets — these are the areas that have been perhaps underutilized — real targets, I think, for tremendous return on investment on your external, perhaps Internet-facilitative communications strategy.

Robert A. Duffy: And there's a learning process in the interaction with these other entities that happens in the corporation and that becomes the fruits of that learning process, becomes part of the intellectual capital. It's tough to capture, admittedly, but it's out there, social entities being, say, art museums, public TV stations, charitable organizations, whatever. Although it's becoming a decreasing portion of their budgets, they do spend a significant amount of money in community outreach. And in fact, if you look at the Bank of America site, you'll see a number of profiled descriptions of what they're doing in the community. I think that L.L. Bean also has similar thing.

Michael Palmer: Yeah, principally focused on the environment and conservation.

Ah, relationships within the enterprise. As we move into our collaborative section, we'll talk a little bit about the Internet and those internal relationships and their importance at all levels to the healthy functioning of that learning process.

So this whole idea of an institutional knowledge, organizational knowledge and experience is one that has great value, but only if it's possible to capture it and disseminate it efficiently. It can be very expensive, and perhaps organizations have not leveraged the value of this repository of information in the past because of the barriers — cost, principally — to making that information available.

As we see the capabilities of the Web mechanisms improve, obviously there will be an explosion of new approaches to conveying, gathering, transmitting, sharing and collaborating on the basis of organizational knowledge. We have table here that kind of steps through time; if you look down the left-hand column you'll see a sort of a time-line approach to the variety of browsers and functional mechanisms available for retrieving information.

Robert A. Duffy: We just want to run through this quickly, but it gives you, I think, some sense of the evolution of publishing modes on the Web. Back in the old days it was just HTML, just raw text. And then in the early *Mosaic* stage, we could bring in JPEGs, and in-line — not JPEGs

in-line. But you could get JPEGs, audio — file-based audio, where you'd have to download it, the same way you would with video — and then it would play on a helper application, in effect. Page layout was pretty much dependent on how wide your window was and whatever in those days. Since then, there's an informed technology and related CGI approaches, image maps and most significantly, to me, the introduction of table capabilities.

If you're familiar at all with a widespread vision of the applications that are on the Web today, you'll see a remarkable use of tables to organize text on the page and to imitate, in effect, the printed page. We have one or two examples of that.

Michael Palmer: We're getting short on time, so I'm going to go ahead and summarize. The intent behind this is to convey the sense that the technology is certainly an underlying facilitator of the means of communication, and that as communication professionals there's a real challenge to employing and managing and taking advantage of these technologies. But it's really not the topic of discussion for us today.

We're really focused on the what and not so much the how, and there are other sessions in the conference that are very detailed and focused on these techniques and technologies, which are absolute incredible accomplishments. You see at the bottom here *HotJava*, kind of an enterprise-wide or worldwide global client server object intelligence mechanism, and virtual reality coming soon, here now in some form. This list will continue to grow and just run off the bottom of the screen, each time adding a new way of conveying those essential core competencies, giving a new way of conveying the intellectual capital, the organizational knowledge and sharing that, doing the organizational learning that we need to see happen to really continue growing in our markets.

Robert A. Duffy: But — have we made this point yet? I don't know.

Text. You can't communicate these things without text. Text is poised for a resurgence on the Web, and I think we want to give you an example, just a real quick one. *Morning Herald* publishes a Web edition. The article changes from day to day, obviously. It's often illustrated, but unfortunately today's isn't. But you can see this is a section — as they themselves admit — for readers, not browsers. You can get to this and read the story or use the table of contents in the right.

Again, this is empowered by the table technology that Netscape introduced. We kind of expected when we prepared this presentation that we would get a lot of resistance to the notion of text coming back on the Web. So to make our point that it's not just old fogies who read the text, we have another site here: "Bookmarks."

Michael Palmer: No, you grabbed "Go" instead of "Bookmarks."

Robert A. Duffy: Well, so much for drama. We're spinning. Should we reboot, or... You can't get to the options? Okay, well, the site that we had was The Spot. Do you know that site? It's kind of a Melrose Place on the Web, and there are about six 20-something residents who ostensibly live in this beach house in California. It's really all fictional, but complete with a selection of very attractive women and men — very vibrant, interesting 20-somethings. Each of them has a diary, and it appears not everyone writes every day, but every couple of days a given individual will write, so you get a progression in their lives. It's sumptuously illustrated, very beautifully laid out, but it's ultimately text-based. And it's clearly a very expensive proposition.

One question that we might suggest — it may have to be rhetorical because of time considerations — what's the commercial benefit of this? Does anyone know what these creative types are doing? How are they going to make money on it? Because they haven't tipped

their hand on it yet, and it's been going for about nine months. If you get a chance to go there, it's Web address is www.thespot.com. It's quite an interesting site, and I think it's been elected the cool site of the year — one or more of the ten thousand or so cool site of the year surveys that are out there.

Michael Palmer: Very briefly, I want to introduce you to the concept of the media architecture. This is something that my firm, American Management Systems, is forging ahead with as a both strategic and tactical means of capturing the intellectual capital and reusing that, repurposing it, transmitting it to cross-organization and to the outside world. The concept behind the media architecture is astonishingly simple. It's the idea that you can gather this information from a variety of sources that is representative of your organizational knowledge: multi-modal information, print media, audio, text, video, news clippings, what-have-you, press releases, etcetera.

Multi-channel is where it gets exciting. It's the idea that from a central repository, perhaps of this intellectual capital, you can instantly transmit, retrieve, sort, and otherwise process for public consumption, information in a variety of ways. As a concrete example, I may have my 1994 annual report, and I have a print version of it. I also have ways for people to not only get a printout and see that, but I have ways for people to get it through the Web. I have ways for people calling in on audio response to have a table of our financial results read to them. I have ways for people on an internal, perhaps touch-screen multimedia kiosk to access the various pages and information pieces or elements of that annual report.

But all of these channels are fed by the same piece of original data, so the idea is to really capture assets as they're created, to capture these media objects, if you will, and make them available through a variety of channels without having to painstakingly go back in and re-author, re-edit, tweak and primp and prepare for press whatever needs to be done.

The tactical vision is, of course, really to store this. It's probably going to be a type of object-oriented relational database, storing both media objects to the base level, as well as composite products — something like that 1994 annual report. I would be delighted to talk with you after the session in more detail about that. The real challenges again, are not the technology but the people, how you're going to get people to both look to these resources as a source of learning and information readily packaged and available, how are you going to get people to collect this and transpose it into reusable formats.

Robert A. Duffy: How you're going to organize and pay for that, really.

Michael Palmer: Exactly. So again, technology, like the Web, Internet and media architecture is rarely the deciding factor in whether a new way of accomplishing something is processed as business, etcetera. It's really going to be valuable. It's really the people that need to adopt it. So a change of management is an incredibly important arena.

And that brings us to the final section of our presentation: collaboration. We've hinted in a great deal of detail the value of communicating by directional communication. We're just going to step up the ladder one more time to say lots of bi-directional communication can be used for lots of tasks and processes in a way that brings people and products and services and organizations together.

Getting back to our model, you can see that we have some clouds here. Up top, within the organization, we have the Internet and the idea of internal webs providing information. Sun Microsystems is already forging ahead, providing most of their internal accounting information to departmental managers through an internal web kind of hiding behind the firewall. It's a very exciting concept because for the first time we may have a real network standard TCP/IP to use

in a real kind of interface standard that's multi-platform.

We don't have issues like, "Are you on a Mac or a PC," or a Sun Box, HP Box, whatever you might have up your sleeve. At first I think it's going to be supplanting existing corporate information systems. But the real value, the real revolutionary value to be had, is in facilitating organizational learning so that the capture of intellectual capital — the capture of intellectual organizational knowledge — can take place efficiently, inexpensively and rapidly so that information is disseminated and put to good use as quickly as possible.

Bob, perhaps you'd like to comment on the Virtual Collaborative Net.

Robert A. Duffy: The Virtual Collaborative Net is simply a virtual segment of the grand Internet. It includes what we have up there — industry allies, partners in joint initiative or multiple party initiatives, partners, suppliers, market outlets; if you're a manufacturer your wholesalers, your retailers, your sales agents, whatever. The Internet provides a marvelous tool to bring everyone together in a collaborative effort. Not only does it open all kinds of opportunities for virtual corporations, but for virtual initiatives in which the parties come and go and change as the initiative matures and succeeds.

Michael Palmer: So with these "intra-nets," we will look to create an environment for broad-based participation in the life of the enterprise through discussion groups, organic databases.

Robert A. Duffy: Organic databases being something like the Lotus Notes or the IBM Notes model. There's a great deal of activity going on now to kind of supplant that mode with intra-net or intra-web oriented collaborative databases that grow from the experience of the people that participate. Discussion groups are a parallel.

Michael Palmer: Of course, departmental Web space is sharing perhaps financial and production information which leads you to the rapid collection and collation of intellectual capital, and then being able to reuse that, repackage that, into your work product.

Robert A. Duffy: Think about the notion in a large organization of letting the departments do their own Web spaces, where they can't do much damage in terms of outside audiences, where you can kind of get those spaces, compare them, fix them and bring them up to speed before you make them available to the general public. Think about the kind of rampant — this may be too harsh a characterization — amateurism that characterized a lot of corporate Web spaces in the early days. This is one way to prevent that from happening, to allow the collaborative energies of the enterprise to come to common cause and to come to agreement on how the Web spaces should look, and work them into the public Web spaces.

Michael Palmer: Of course, being able to do these things really means that that intra-net becomes the lifeblood of the company — managing human resources, managing your projects initiatives and allocating resources. I mean, think about the opportunity to build virtual work force capabilities. Why relocate staff when staff can relocate virtually through collaborative techniques on the internal networks?

Robert A. Duffy: Everyone doesn't have to be in the same place to participate in the same initiative. How many people are currently using audio conferencing on a routine basis? Video conferencing? Not as many. How about screen sharing? Application sharing? A few. That becomes more industry specific, although it can be said that even for design firms' product management, many of these techniques are available today that are facilitated by the internal

and external networks, and a considerable value to be had by building these virtual work force capabilities. The external networks, of course, are the embodiment of an organization's relationships with the outside world. You do the same things with those that you do internally, but with a different group of allies and partners.

And to borrow a term from the Japanese: koretsu. This is kind of koretsu at large, koretsu squared, where you can collaborate with other organizations but you don't have to be wedded to them for half a century. Virtual collaboration.

Michael Palmer: So to conclude, we started with a view of the world that was commerce-oriented — purely mercenary transactional buying and selling of products and services.

We added to that to include more of the communication aspect, perhaps supporting some of the more traditional functions of customer service and support sales and marketing fulfillment — information about an organization's image, identity, communication aspects, reaching opinion leader audiences.

And we wrapped up with the collaborative model, where all of these things take place and the organizations that are looking forward and are smart about this will be capturing the results of these processes and activities in their organizational knowledge banks to continue learning and growing well into the next century. Thank you all for coming today.

PUBLISHING ON THE INTERNET COPYRIGHT — LAUNCHING CONTENT ON THE INTERNET



SPEAKERS

David Bernstein

Vice President, Marketing, Electronic Publishing Resources

David Van Wie

Chief Technical Officer, Electronic Publishing Resources

David Bernstein: Thanks for coming to Session: “Launching Content into Cyberspace.” My name is Dave Bernstein from Electronic Publishing Resources. We’re going to talk today about putting content on the Net, and the interesting copyright challenges that poses and some innovative ways people have set out to solve them.

I am with a company called Electronic Publishing Resources from California, where it is slightly warmer than it is here. But nonetheless, we are a company dedicated to the development of technologies that solve exactly this type of problem. So I’m pleased to come speak to you today on the next frontier of the Web, which is actually getting good stuff out there that rights holders feel okay about.

The issue we’re talking about here is digital content. This is where digital information is the product. Now, obviously there’s quite a bit of commerce on the Web happening today, where you go ahead and purchase an audio CD or a video tape, and once you get your credit card number across and so on, then FedEx arrives tomorrow with the product.

But it’s a whole different game if the product is delivered digitally, isn’t it? Because it comes over the wire and then you have it — or at least that’s the current school of thought in most people’s experience. But when digital information is the product, we really see a whole other interesting set of issues, problems and challenges, and a whole new world emerging that really enriches our use of the Web and makes this whole electronic commerce information commerce, which is an important new kind of approach to this.

Where digital information is the product, we obviously have some key applications: electronic publishing in the normal sense of newspapers, news, books. Publishing, of course, is not restricted to simply text; [there’s] publishing of audio, publishing of video, multimedia, publishing of interactive works, business information.

Obviously the electronic media, the Web in particular, is a very appropriate media for delivering highly timely and very important news items. In terms of business information, it is often very, very valuable. Market studies, stock quotes, competitive information, product reviews — these are things which the information-providing companies spend a lot of money putting together that you count on for your business, and you want to be assured that digital product is delivered to you not only completely but also with integrity, so you can trust it.

Clearly, interactive multimedia is something that is mostly digital, with CD-ROMs and so on. And we’re going to see this delivered over the Web and the Net more and more as bandwidth increases. Computer software [will be delivered] in a way beyond the shareware model, where software is delivered directly, and [you’ll have] entertainment products, typical movies, and audio, as I mentioned, from the whole recording industry. And all of these things really are in digital form.

Now let’s figure out how to actually get them in electronic media as opposed to waiting for FedEx to deliver the physical version of this product. It’s worth thinking about how these things have multiple delivery vehicles. You can obviously expect to get these digital products over the Internet, which is great.

CD-ROM is something we’re all familiar with, in terms of interactive media, multimedia products, in terms of software, in terms of reference materials. Clearly cable, broadcast and

satellite TV are other mechanisms whereby we receive digital information. The DSS Satellite System is one example of a direct-to-home digital information delivery mechanism. Private networks and dial-ups, such as the major on-line consumer services, are an example of this.

And combinations. Now, this is quite important when we start considering the richness of digital information. When you start looking at products, for example Microsoft's *Baseball* that comes on a CD-ROM, for which you get updates on-line, or other combinations thereof where you get software on a CD but updates on-line, or products that come on CD and then additional information comes through the Internet. So combinations of media as a delivery mechanism for digital products is something that's very important and will emerge as very important. Things like entertainment products on these high-density CDs will come out, but you'll want to pay for them over the Internet. So this is the world of digital content.

Information commerce is digital content that's delivered in some kind of a secure way so that you can treat it as a product. Now, what this means is [you get] the digital content plus some way to pay for it in a secure fashion. Clearly that's the commerce angle of information commerce.

When you really start considering, how do I get digital information now? How do I get information now when I get an audio CD or a publication, a multimedia product or a videotape? That sure has had a large value chain behind it. This is important, because I don't actually buy the book today — a book, a physical book from the author. I buy the book through a rich value chain, from author to publisher to distributors of the book to retailers and so on. There's a whole value chain that happens in commerce. And obviously, the same thing happens with software. The same thing happens with entertainment products. The same thing happens with most products, and information products are, of course, no exception.

There really is a value chain, and that really requires some way to enable multi-party transactions. So one of the interesting aspects of information commerce is not only digital content and a way to pay for it, but a way to enable a value chain, mirroring the way we do business today.

Clearly, something very important in the whole world of commerce is information about how the value chain is running, and this is the sort of back-channel, or exhaust, of marketing and usage information that's so important to making the whole value proposition work. If there's an advertising model along with the product, or some kind of a coupon, that all relates to the value in what you receive.

The demographics that a subscriber list yields is a very valuable piece of information, and this is quite simple if the newspaper is thrown on your driveway each morning. But of course, it is much more complicated if you're going ahead and surfing the Web and buying your digital content that way.

So all of these elements add up to information commerce.

What we're going to look at is how we can enable information commerce in this context. Well, we need some new pieces to the equation — new pieces above what we have in the Internet world today — and that is protection of copyrights and this notion of licensed uses for the properties that are launched.

In other words, when somebody spends time and creates value and puts it into a digital form, then they have some rights in that product. Well, it sure would be great if their copyrights were respected, if they got paid or whatever, or other requirements. That way they could go ahead and launch their content into these digital domains and it will meet the criteria that they've established, since they own the content.

There's got to be some way to get paid efficiently. Now, we say "efficiently," and we use this word "micro-transactions," because if you think about it, some digital content, like an entertainment product like a movie, or a large whole body of research work, is probably pretty

valuable and worth several dollars or more. And that has enough value to it to sustain an entire transaction, which may have an overhead of a dollar or thirty cents or twenty cents associated with it. In fact, most credit card transactions or on-line systems today do have some overhead amounting to north of twenty-five cents.

A newspaper article or some other small piece of digital information, or maybe just listening to an audio product once, may be less than a few dollars worth of value. And so therefore we have to figure out some way that we can market digital content over the Net, understanding that we have an overhead in terms of a transaction and allowing people to buy products for one cent, a tenth of a cent, a hundredth of a cent, whatever economic models work. We need some way to get paid for these teeny micro-transactions that add up. Millions of people seeing one article in one newspaper adds up to a reasonable amount for the author to get paid for writing it.

Clearly, collecting usage information is something where we've really only hit the tip of the iceberg with the notions of the different hits on Web pages. Now we're talking about actual, real usage information of the digital content, and this is something that's extremely important so that creators and distributors of products can understand how people are interacting with their content.

If it's a magazine with some advertising in it, are ads being viewed by readers? This is an important component in the whole model of advertiser-supported publication. If it's an on-line catalog, what areas of the catalog are people shopping in? What areas are they ignoring? And clearly that is very valuable. If somebody spends time on a particular ad, then that advertiser would pay for that data so that they could send them follow-up information. It's lead-generation; it's this backstream marketing usage information that's very valuable in the whole world of making information commerce work.

Clearly, ensuring advertising [is important]. If somebody opens a newspaper, there are the ads and they see them. But how do you do this on the Web? How do you make sure somebody actually reads the ad before they view the content? Maybe that's the business model that the creator has put as a requirement for launching their content: check out this ad and you can watch this movie for free. Likewise, [there is] support for both traditional publishing models and new publishing models. If we can enable all these kinds of requirements and add them to the notion of digital content, now we're really starting to talk about information commerce, bringing the notion of buying, selling and processing information on-line.

Let's just take a look at how different this new world really is by first looking at the way it is today. This is the classic publishing model where transactions and control go through a central publisher; and when I say publisher, this can really apply to traditional print publishing as well as publishing of different types of multimedia, software or what have you. But certainly central publishers' clearing houses and financial institutions really are at the center of the way information is distributed today.

There's the publisher, and the customer will go ahead and get the product from them, and there will be usage information and billing and the financial institution will deal directly with the publisher to get some remuneration there.

Here, by way of example — and I'll use a newspaper subscription as an example — you pretty much get bulk distribution. This means that you get the whole newspaper thrown onto your driveway, or the whole magazine, regardless if you really want to read all the articles there or not. You go ahead and you pay for a whole month's worth or a whole year's worth of newspapers, and that's pretty much how we do publishing today.

The rights are enforced by contractual and legal agreements, which means that it's pretty much expected that you won't go ahead and copy the newspaper and hand out physical, xerographic copies of the newspaper to all your friends in the neighborhood. It's protected by

copyright law — and by legal agreements, if it's a more exotic product. If it's a research report that you've ordered or you subscribe to, then of course when you buy that research report you pretty much say, "I won't copy this and distribute it. It's for my company or my personal use only." Business newsletters are also an example.

So really there's a complex set of legal agreements behind all of this. Of course, the writers who contribute articles to the newspapers are also bound by legal agreements between them and the publisher; and so we've created a whole series of legal agreements which govern how all the rights of the various parties in the value chain are put together.

So really, there's only physical disincentives. In other words, it's a hassle to copy a newspaper, and so you probably won't do it. Likewise, a videotape copy is a hassle and it doesn't turn out to be really a great copy anyway. So you know, you really could go ahead and violate these rules, but it's mostly a physical disincentive.

And then, of course, after-the-fact compensation and reporting to the value chain means that after you've gone ahead and paid for your newspaper subscription then eventually everybody back upstream gets paid and they can some day, months later, get the demographics and the subscription information.

This is today's world of information commerce and by and large, across industries, print publishing or entertainment products, this is how it works.

Some people have taken additional steps in terms of trying to move this a bit into the digital domain, and let's reflect on some of the current state-of-the-art technology and see how well this answers some of the problems on the digital information commerce requirements we set out earlier.

We can go ahead and lock or unlock the content. I can deliver this encyclopedia or this demographics or this digital product on a CD, all encrypted for example, and then when the user pays me I can unlock it and then they have access to this. Of course, now they have access to this completely, so once it's unlocked they have the content.

Likewise, if I license-manage the content — in other words, I'm allowed to access it for a period of time or a number of usages through a license manager, a network license management sort of scheme, likewise the content is unprotected. So now I have it; I have it on my machine and I can do what I want with it. I can save it, I can post it, I can put it on my own Web page — and we all know what happens to it then.

There really isn't a pay-by-use model or any kind of usage or data collection in these schemes. I might have a large body of digital work, and I've unlocked it, but I really don't know what parts people are using. I really don't know how many people are using it or how much they're using it. And these schemes are usually pretty strange business models. Like you can use my information-packed CD for a year for \$5,000, and I don't really know if a single user is using it or if he's put that CD on his corporate LAN and ten thousand people are using it.

So this is not really great. And besides that, license management schemes usually require some kind of LAN. They have quite a bit of overhead associated with them in terms of administrative issues, and those of us in the business know that that's really not a very sophisticated security mechanism. It's very easy to spoof a license manager.

So let's look at some more recent things that have emerged. They protect the "wire schemes," as we call them, and this is a way to ensure that when information goes from point A to point B it can't be taken while it's in transit. And I think we've all heard of various schemes, SHTTP, SSL, from folks like Terisa and Netscape, and there are some others. These are more or less software renditions of the hardware crypto-routers that have been around for some time, and they are basically a great application of cryptography. [There are] two problems, such as Sockets-based TCP/IP communication or Web-based communication, but they are usually specific to a particular type of transport; it's pretty hard to use SHTTP on a CD-ROM-based

product, for example. And what it really does is it secures the transmission of content from one place to another.

So it really doesn't end up protecting the content. The content and the information are released in the clear at both ends. In other words, they're in the clear somewhere when they leave the author's desk, and it goes ahead and becomes encrypted and protected. Maybe payment is assured, and it is probably. It's actually a great way to make sure a credit card number gets from point A to point B, but as we've seen, rights holders and users are left unprotected. In other words, the content is released in the clear on the user's workstation, and if I use these same schemes to encrypt the user's usage information my private usage information is now left in the clear in some clearinghouse server. So although I've ensured that it hasn't been intercepted, if these are implemented properly I still really haven't solved the problem of whether the content is being used in the way that the rights holders want, and whether my usage information is being used in the ways I want. So [those are] good approaches, but strictly first generation.

There have been some initial technology approaches doing what we call "information metering." A few different vendors are mentioned on the slide here who have implemented some kind of a pay-by-use with usage data kind of technology, usually associated with some particular type of information delivery: for example, a CD-based information metering. So I can now supply the CD with a bit of hardware that will meter the amount of information I use off of the hardware, and likewise some other kind of scheme.

These usually require some hardware token, like a smart card or a black box that stores this information, and that's a bit bulky. They usually include a specific clearinghouse or business model baked into the system, which limits the way people can cast a business model. It really doesn't implement the value chain, and that's really still what we're searching for, this general-purpose, multi-party, value-chained way to launch information out there into cyberspace.

So here's what we need. We need some kind of enablement for these traditional commerce practices in the electronic space, a chain of handling and control and some way to enable ad hoc agreements. In other words, I like something that I've gotten and I want to pass it on to somebody else, and I just want to make sure I'm not disrespecting any of the rights of the value chain as to how the information got to me.

I want to go ahead and allow independent roles in the — rules in the value chain so that I can go ahead and say, "Well, I found this information. I'd like you to let me know if you're using it or not, or put an additional price on it."

The way to do this is to encapsulate the content in a container of some kind; in other words, protect the content, not the wire. This is an important revelation that we've had, and now a few other people have caught onto it in this world: that you really need to take the content, the business rules and the usage information — the "exhaust," we call it — and package these things in some common, protected form of transport that can sit on top of whatever media or wire it moves around in, some kind of container technology that protects the content in a persistent way. Of course, what this will allow us to do is integrate this notion of this protected content and protected information container into a whole end-to-end integrated fashion. It will give us some efficiency and some automation, but most of all we'll get some good stuff on the Web, because people's rights will be protected.

We can enable this kind of new electronic publishing model where we have direct value chains for delivery of products so we can get new models like customer-to-customer delivery of content, which in the traditional publishing model is basically illegal. But we would like to enable that in the Internet world — the passing on of information — while whatever rights and billing and so on that the original creators have put on it is respected.

And so you see this model where authors go to a publisher and then we can get all kinds of different value chains involved here: customer- based distribution or “super-distribution,” as this is known, multiple relationships with clearinghouses, value chains here, and also the ability to cut and paste so I can take information I like, take a part out of it, put it into my own document, redistribute it and the original author of that piece I took will still be compensated or his rights will be respected, whatever the case may be. This is the new electronic publishing model, and this is the way the Internet works.

And so we’ll go ahead and take a look at what this container technology looks like to enable this. What we’ll get in this is this notion of targeted distribution and micro-payments. Remember when we talked about the newspaper subscription, and I got the whole newspaper plopped on my desk, or rather on my driveway? Here I can just take an article and pay for it. That seems pretty obvious. But I’ll get rights enforced by the computer system; in other words, I can’t just pass this on to anybody because it’s owned by Associated Press or Reuters or somebody else, so I can go ahead and have some kind of cryptography or security mechanism included in this scheme that allows rights to be protected.

Compensation and reporting needs to be built in into the system. So when I go ahead and view this article, whoever needs to get paid or reported to gets paid or reported to, and it’s not a big deal for me as the user.

The interesting thing is that this goes ahead and enables new business models. It now allows anybody to package information in containers, to move it around and to use a variety of paths that don’t restrict a particular business topology because all I have is A-to-B security.

Now my company, of course, has this technology called *InterTrust*, which is a virtual distribution architecture enabling this type of container technology. We call this container the “Digibox,” which is something which can hold content, control information, financial information, backstream marketing information, all the information and the rules and controls necessary to implement this type of system.

What we have announced here at the show today is something called *NetTrust*, which is a product based on this technology for the Internet and on-line services, allowing people to launch their content into cyberspace in these Digibox containers, and have them have persistent business rules and controls associated with them.

This really provides for the first time a multi-party way to get content out there on the Internet and other networks. And as you can see here, it is 100% buzzword-compliant in terms of what we’ve put together.

A diagram of how this might work is [one where] I’ve placed content into a container; I’ve placed control information into the same or a different container and I want to move these things around amongst the different information appliances involved in the system. This might be a Web server, this might be a *Mosaic* or a *Netscape* client; in the future this of course could encompass other Internet access devices such as set-tops or PDAs, and there’s a bit of software that runs on each machine, participating in this system which understands how to deal with these containers. And these containers can move around in whatever topology is necessary and make sure that all the information goes to the right people in the value chain, and that people get compensated if that was the rule and that the rights are upheld, because the information never leaves the container and is never out in the clear and so therefore content holders, people who we want to put their stuff on the Web, can now do so with this technology.

Just to give an example of how this might work, here you can see some rules and controls in one container, some content in another container, indicated by this camera and this little audio wave and some books. These things can meet up out there in cyberspace. For example, maybe I get these rules and controls from one place in the form of my pre-authorized

credit card, or maybe I get the content from a Web site. I could process it, I could use it, I can pass it on to my friend. They can process it and use it; maybe they pay with a different payment method. If they like part of this they can extract part of this, and it's still protected. They can pass that on to someone else. And voilà — we now have a bunch of great content on the Net because it's protected in a persistent and permanent way.

The way this container looks, just sort of a brief overview, there's quite a bit more to this type of technology than simple, point A-to-point B encryption. You can see here that the content container holds information, it holds permissions, it holds things like budgets and methods, to allow for virtually any type of business model.

This whole notion of these rules and controls in this part in the middle here is very much a completely programmable system. I think we've all watched how fast the Net and the Web have evolved over time. It's very important to separate the business rules and the way people will do business from the actual content itself, because I'll tell you, we'll be here at this show next year and there will be a lot of different business models not even contemplated this year, and that will happen again and again. So we really want to get content into a container and express business rules in such a way that it's independent, so it's not baked into the system in an unchangeable way. And so you need to do this in an object-oriented system diagrammed here.

For example, I might have a property here which might be a encyclopedia — let's say a 1995 encyclopedia with a control set, and which has some kind of pricing. And [there's] another property which doesn't have a control set associated with it, maybe it's a World Book Almanac. I can launch a second container later on which goes after I buy the World Book, and I enable this with an additional control set, and by buying this World Book I've now gotten a discount on the initial encyclopedia.

So these are some interesting things you get when you have a container technology and you have independently deliverable rules and controls. I could send out in another — when it's 1997 and the World Book and the encyclopedia are still useful to some, but maybe can't command the same price that they did when they were leased in 1995 — I can send an amending container out and lower the price once those [with] the content is launched. Because once it's launched, I don't have it anymore. It's out there on the Net. So this is a very flexible and robust system.

What we've announced at the show today is something called *NetTrust* for Internet-based publishing. What content creators do is take a packaging application, dump their content into it in whatever form it is — HTML, Acrobat, MPEG, whatever — put it into a Digibox and then go ahead and use a rights editor. Creators can go ahead and say, "Well, here's how I want my content used, and here's how I want to get paid for it," or "Here's the usage information I want." They can then go ahead and put that directly on the Web or enable a value chain. In other words, the independent author may say, "Gee, who's going to visit my Web site? I'll make a deal with some large Web site to go ahead and market my content." And of course, that Web site can go ahead and further use the rights editor, uplift the price, add different payment methods and so on and so forth, enabling a whole value chain.

We have a tool which then slams this right into a Web page so that people can access it easily. Then users can go ahead and access this stuff by downloading some client software, which integrates in a number of different ways, although you can envision it as a helper application to a *Netscape* or a *Mosaic*. So it's very transparent. You can either link to it directly or use *OLE* to access the interfaces to existing browsers, and we'll show this with *Netscape* today. What you get is a whole secure transaction processing environment downloaded onto your desktop, and this enables the micro-transactions to occur. It enables the business rules to be respected and so on, and of course a clearinghouse application based on some leading

relational database systems which allows clearinghouses then to process the usage or financial information. So that's what *NetTrust* is.

How this works on the Internet I think is pretty obvious. The authors go ahead and place their content, using business rule templates, into a container using, for example, a Windows application. They might give this to a distributor or aggregator who is a large Web site, who may uplift the price or what have you. Now, note that when the container left the author's desk it's protected, because I as an author probably feel a little squeamish about giving my content to some major Web site. Is it really going to be protected?

This allows me to have control over my content; and then people can access this through standard Web sites, downloading some software if they need the helper application the first time. It's really quite more extensive than a helper application, but that's what it looks like. And then they go ahead and access content. It's really quite transparent to them, but they are respecting the rights holder's rights there. Then, in whatever business model the repository has set up, they go ahead and pay for this report usage and so on and this finds its way to the authors if necessary, to find the usage information they have specified.

So what you really now see is a value chain, which is very different than simply client and server kind of information vending. It's a much richer system that we really think will help enable content on the Web.

This is not something that is competitive or overlapping with some other technologies; this is something that's complementary with some of the payment systems you've heard a lot about that are out there. This is complementary to the electronic funds transfer type of technologies. This enables this super-distribution or launching of content onto the Internet, so this is complementary technology. We think it's a really important missing component to the whole way we want to buy and sell and use information in digital forms.

There is obvious huge list of millions of ways that protected content can be used. Today we're focusing on our *NetTrust* Internet product. Here, we're at an Internet show. I should let everyone know this is exactly the same problem that people face in the broadcast and cable TV industry, where these high, high capacity CDs are starting to hold digital forms of entire movies. Content creators are very nervous about this. Clearly, this is the whole notion of information databases and so on being provided in digital form, and this is exactly the same problem. So it's nice to have a standard container that can hold content on any medium.

By way of conclusion on this section, you have to protect all the information and all the transactions. We think that not only does the content have to be protected, but the rules and controls and the integrity of the content must be protected, the usage information must be protected. There's a lot more to it than protecting the wire. We have to support lots of different evolving business models and real value chains that we can't even anticipate today. Anybody who tells you they know how business on the Web will be done even two years from now, you should raise an eyebrow about. And clearly, the way the Net works, [there is a lot of] passing on of information from one individual to another. You'll hear a lot throughout this conference and coming up about some standardization efforts on these content containers; we really need to get an environment on everyone's desk so that people can go ahead and have a secure environment on the Net, and also create an infrastructure that allows for this to happen.

So next we'll show you a couple of screens of what this really looks like.

I'm going to introduce my colleague, Dave Van Wie, our Chief Technical Officer, to go ahead and do this.

And I apologize — the on-screen versions are quite hard to see here. Unfortunately, it's kind of a low screen, so I'm going to switch one of these to an overhead on my right here, which is somewhat easier to see. So bear with us.

David Van Wie: While Dave gets this set up, why don't I introduce the segment we're about to move into here? As Dave indicated a moment ago, we're showing you some shots from the user interface that goes with the *NetTrust* application suites that we've announced at the show today.

This first slide that he's put up there shows a portion of the user interface manipulated by the creator. And in our models we've really worked quite hard to make this process as straightforward and as automated as we could. In this example here he's showing you the portion of the interface where the user would go ahead and identify the content that they wished to put into the Digibox, as well as attach some descriptive information that would follow that content around.

Now, since the heart of the value that you're delivering is encrypted, it's important to be able to attach marketing information to that as well as simple abstract information, so that people are able to make a buying determination without actually digging into the valuable part, the "for sale" part of the content. And he'll also identify a template that describes the business rules that go with that particular category of content. This allows you to radically simplify all of these mechanisms that Dave was speaking to earlier, which actually — and when you really think about how your businesses operate, there's quite a few nuances and quite a few details, but normally you can apply those nuances and details again and again to different pieces of information.

Why don't we move on?

In this slide here, we're looking at the distribution rights, because it's critical in order to enable these kinds of value chains that Dave was speaking to earlier that you be able to describe how it is that value chain participants can manipulate the business rules that you've set out for protecting various usage activities with respect to your content.

And so here we've gone ahead and identified — we've got one of the screens up here that shows a few of the business rules that you're able to establish over that value chain, including the ability to identify new events that you may very well want to charge for.

Let me give you an example of that. An aggregator may make a determination that they're willing to go ahead and foot the bill in accordance with the publisher's business model, because they may have an aggregated value. For instance, if some content provider wished to charge, for example, a dollar to access a piece of content, an aggregator may go ahead and subsume that into a different model. Maybe they pulled together fifteen or twenty different pieces of content and they want to rent that to people for \$2.50 a month. This describes whether or not you as a provider are willing to participate in that type of a value proposition.

Let's move on.

As I indicated earlier, some of the business rules that are involved here can initially appear to be quite complex; so what we've done is we've used the power of graphical user interfaces to go ahead and present this to people in a comprehensible way. Here you're looking at a screen from our rights editor, which permits a user to go ahead and identify all the categories of user activities that they're interested in, either for collecting usage information, enabling or disabling, as well as attaching pricing models.

So in this case here you start off on far left, identifying a usage activity. In this case I believe it's an "open," but it's hard to read from this angle. So when somebody opens up a package we're going to go ahead and follow through the rest of a transaction.

Now we're going to step into a metering phase of a transaction, where we're going to record some of the usage information. Now in this model I believe we've gone ahead and said that we're going to record a transaction each time the thing is opened. Other models would include just keeping a record the very first time something was opened, or every tenth time something was opened.

[Tape change]

David Van Wie: The second stage or the third stage is that of the actual billing activity. Here we've identified something quite straightforward, where we're going to associate a simple price with this particular transaction. Now we can do things that are significantly more sophisticated at this step if our business model calls for it.

For example, in the software industry people engage in suite purchases all the time. So at this stage, you could base your pricing decision on information that's elsewhere in the user system. For example, that they already own rights to use other software packages.

Another model might be that you want to have a competitive price. Certainly, a more practical model in the global environment of the Internet is to allow people to pay you in different currencies, so you can establish different rates or conversion rates for different currencies at that step.

So as you can see you can start off with something really quite simple, but as you explore the subtleties of real-world business models different factors can come into play. That's why we felt it was necessary to produce a generalized programmable system that lets you actually describe your real business.

It's also important to allow you to capture all of this into a template, as I indicated earlier. You certainly don't have to do this every time. Once you figure out the model that's appropriate for categories of content, you can reuse these business rules over and over in container after container.

Let's skip this one, Dave.

Okay. Now here I'm indicating a modification that might occur in the value chain. As I described earlier, we had a transaction starting off with a particular type of usage activity — in this case, opening a container. And then we're going to keep some records about that, and then we were going to associate a pricing structure. Now, in this model here a value chain participant, an authorized distributor, has added their own rule. In this case here they've split out of the metering activity and are establishing their own price for that particular action.

There's some important concepts here to include in any system like this. It's very important that the user's experience be that of the final value chain participants, so that the model that the user experiences is the one that the person who's directly interacting with them has defined. So in this case, the user will transparently see the aggregate of both of these different billing activities. However, there is adequate information collected such that this can be sorted out, either by that last value chain participant or by some third party, some clearinghouse somewhere, that sorts out all of the various payments that go to each of the parties.

We've described to you a little bit about how we would prepare this content, and we talked a little bit about how we would identify content to put into a Digibox, the categories of content that were out there. Dave spent quite a bit of time discussing that. I've been showing you some of the application software that you would use to package a Digibox and some of the graphical tools that we would use to describe the business rules that go with that.

In this screen here we've gone ahead and taken a simple example of how this might appear to a user — what the user's experience would be of this type of an environment. So we've established a WorldWide Web page here and you'll see that there is a piece of content indicated as an icon on that screen. You also see across the bottom there a collection of our system software churning away in the background.

As Dave indicated, from the user's point of view, our system in that landscape appears as simply a helper application. But these generalized tools lie in the background.

Go ahead and move on here.

I suppose an important point with respect to that is if you wish to add a CD-ROM integration later on, the user doesn't have to change the basic tools that they've been manipulating all along.

So once a user's clicked on that content — here, I'm going to bring you through a couple of user interface screens. These are all configurable so the user doesn't have to see them every time; but since this is your first time we've gone ahead and turned them all on. The first thing that the user is asked to do is to make a decision about how they want to register this content, which parties they want to interact with to perform payments as well as which collection of business rules they want to apply.

An important capability here is that this model allows you to define different categories of usage activities — different classes, if you will — such that a user who wants to take a trial run through your properties can go ahead and use one set of models. For example, they may pay a single, low rate to use a property once, and then you can also package in there a set of business rules that would describe purchasing broader rights to the property, for example, so that they could use it an unlimited number of times as long as they did so in authorized ways. So that's the first interface that's presented to them after they've clicked on "consist-sub" in this particular integration.

After they've successfully made use of the content they have other tools that they can use to look into their system to see which Digiboxes have arrived there and what their rights are in those particular Digiboxes. And then it's almost accumulating usage information, which is seen down in the lower right.

It is very important that these things be done in transparent ways, such that you don't interfere with the user's experience of your content.

Once they've gone ahead and registered the content, or if they've made a set of generalized decisions about how they register content — for example if they always want to pay with their VISA card and they always want to work on a pay-per-use model, they wouldn't have to experience any user interface interaction at all throughout their Web surfing experience.

Is that the last of the slides there, Dave?

I know that's kind of a little bit jerky on the run-through and just the screen-shot model; we do actually have a machine running these applications. Those of you who may be interested can come by and talk to us afterwards so we can show you a little more detail if you're curious about how this product works in more detail.

So why don't we open the floor and take some questions? Yes, sir.

M: I have a couple questions. How do you charge for your product? On a transaction basis?

David Bernstein: Yes. The question was, how does EPR charge for our technology? We're a middleware company, so we're supplying this company to partners who are integrating it into their on-line service and Internet products. What we expect will be the model will be the normal Internet model, and that is that the authoring tools and the client-side tools will have no charge associated with them, and EPR and its partners will make money as content actually flows through the system. And so yes, that will be a transactional model.

Question in the back. That's you.

M: You mentioned that there were some standards activities going on this year. Could you talk a little bit about who's doing what standards work?

David Bernstein: The question was, "Who's doing what standards work?" Dave, do you want to —?

David Van Wie: Yes. Actually, there will be a meeting a little later on today, I believe, over at the Swiss Hotel, that's being sponsored by the IIA, and they're putting together a new group. I believe it's called the Electronics Rights Management Group, which has representatives from major companies as well as people who are providing services, and then ourselves, the ones providing technology in this space.

M: Can you give us some names of companies [inaudible]?

David Bernstein: Wait for the announcement.

David Van Wie: The announcement will be made a little later on today, so I don't want to pre-announce who will participate in that activity, but certainly many major providers.

M: What's the pricing on these cards? And are they all in the chain you talked about? Where do your products come in, and how much do you charge for them?

David Bernstein: Repeat the question.

David Van Wie: Okay. The question was, "Where in the value chain do our products come in and how do we charge for them?"

Let me just summarize real quickly again what the pieces are. We provide a user application for packaging content, a Digibox packaging application. We provide a rights editor that lets you describe using the graphical tools I had up just briefly and lets you describe the business rules associated with your content. We also provide a tool for taking Digiboxes and automatically building Web pages from them, and then we provide the system software that integrates into your system so that you can allow *Netscape* to run more or less transparently with protective content. And then, finally, we provide a clearinghouse application.

Now, as Dave indicated, the ordinary Internet model is one that we find very attractive, which is that the authoring tools and the *Netscape* integration will be provided for free. And then EPR and our partners will participate in the transaction flows that are caused by content. So that would include the whole intermediate value chain.

Yes, sir.

M: As author or publisher, one side puts my content in your container and it moves out, and a user decides to just take part of that; how do I determine what part I want taken, what part I don't, or do I have to make it total?

David Van Wie: The question was, "Once something is inside of a secured container, can authors or publishers determine which portions of it a person can extract and describe the business rules that would be associated with that?"

And the answer is that using the *NetTrust* model, yes, you can describe that. And part of the authoring process that we didn't go into would involve describing the pieces of the content that you would permit to be extracted, including the granularity and so forth. And then those represent a special category of events just like the open I was showing a moment ago that you can just completely describe business rules for.

Yes, sir.

M: Having to distribute a database like that for the use of information, are you assuming a live connection at the time of payment or do you have some kind of facility for deferred payment and accumulation of usage data as a bolt or a fast job?

David Van Wie: The question was, "Do we require some kind of live connection or are we able to aggregate transactions and then send them through as a batch, if you will?"

And the answer to that is also yes. We can do it either way, actually. Some transactions are sufficiently high value, and some business models will require that you form an on-line connection to fulfill the payment part of the transaction. We provide technology that lets you aggregate transactions locally in a secure way and then transmit those periodically to a clearinghouse or to a publisher, whomever is going to take on the responsibility of actually clearing those and getting the bills paid.

M: Can you describe the difference in your business model from other metering companies like InfoSafe and Wave?

David Bernstein: Do you want me to take this one?

David Van Wie: Yeah, why don't you take this one.

David Bernstein: The question was, "Can we describe how our business model differs from other metering companies such as InfoSafe and Wave?"

Without speaking for what their particular business model is, I can tell you that we are a middleware company, although our implementation works in a software-only mode, or with secured hardware such as a smart card or other pieces. We do not sell a piece of hardware; we have partnerships to do that. And although we have reference implementations of clearinghouse software, we are not a clearinghouse. We have clearinghouse partners.

So in those two aspects, there have been differences in our approach with other companies in that we are purely a provider of technology, and software technology at that, and not a provider of a piece of hardware or a clearinghouse. There will be multiple clearinghouses for people to choose from, and multiple implementations, those that are software only, those with hardware and with a variety of pieces of hardware. And so to that extent I think we differ from those models. We think multiple clearinghouses and multiple models of security, hardware, software and so on will emerge over time and we'll support a lot of them.

Continuing on your previous question, I'm sure. New question.

M: Well, I'm here wearing several hats, and some of the interests I'm representing, so to speak, don't give a damn about payment. They're in the business of distributing information at no charge. However, they're very concerned about the integrity of information they distribute. They don't [want it taken] out of context. We don't [want to] see it modified.

From the presentation you've given me, I feel real good about the data until it gets into some kind of application. What I'm saying is, it looks to me like their castle is reopened, but I'm having trouble understanding, until third-party application developers respect your business rules, how today a Netscape user is going to read the text of my customers without being able to copy it?

David Van Wie: The EPR has not invented an anti-gravity machine. Let me repeat the question here. The notion is, how is it, without third-party developers adopting this model, such that we have the system out there broadly, and well integrated...

M: We're out of time.

David Van Wie: Are we out of time? Well, I'll be quick. You can, if you deliver this directly back into *Netscape*, copy it and save it, and existing copies of I.X models of *Netscape*. In future versions of *Netscape* they've promised us all that they're going to give us an API that lets us control the user interface, and that will allow us to improve our existing helper application such that it can go ahead and control printing.

For example, you may enable it, but send a signal down into the protective processing environment to record how often that's done and perform the charges and so on. That speaks to one aspect of it.

I should mention that our existing helper application today has a full user interface for text and graphics and movies and so forth. So rather than handing it straight back into *Netscape* for the most transparent model, a publisher can choose to have it land inside of our helper application, where we do have full control over how these things can be done.

Now let me make another point. We also use watermarking, or what we call "fingerprinting" techniques. As your content is released you do have the ability to keep track of who released it, when they released it, which machine it was on and so forth. This provides a relatively powerful disincentive to copying.

Let me make a final point with respect to integrity. We don't have to associate charges with any of the activities; in fact, you can ship out your content either for free or on a subscription basis, and if you simply inform the customer base that if it arrives in a Digibox, you know it has integrity. Therefore, if they receive it in the clear, it's not inside of a Digibox, it's suspect. And it's certainly a transparent model, so if there was no charge associated with it they would see nothing except an indication that it had been received with integrity.

M: What platforms...

David Bernstein: Let me close it up. Okay. Final question — what platforms? All the various Windows platforms today, Mac and Netware tomorrow, in the figurative sense, of course.

I think we're out of time. Thanks for the good questions. You'll see on the screen here the requisite Home Page for EPR, www.epr.com. Visit us if you'd like more information, and don't hesitate to come up and chat with us. There is a panel in the next session with several experts in the digital copyright area for those who have additional interests in this hot topic.

Thanks for coming today.

PUBLISHING ON THE INTERNET COPYRIGHT: A PANEL/AUDIENCE INTERCHANGE



MODERATOR

Dave Bernstein

Vice President, Marketing, Electronic Publishing Resources

SPEAKERS

David Van Wie

Chief Technical Officer, Electronic Publishing Resources, Inc.

Eamon Fennessy

Chairman & CEO, The Copyright Group

Kelly Frey

Director of Business Development, The Copyright Clearance Center

Arthur Hutchinson

Senior Consultant/Principal, Northeast Consulting Resources, Inc.

Dave Bernstein: Thanks for suffering through our bit of disorganization here as we get a little overwhelmed with questions from the last session. I guess that's a good thing.

This is session G-2, a discussion on electronic copyrights and I'm pleased to say we have a panel of distinguished experts in the area, who will each give a five minute or so presentation on some of the issues, each from differing perspectives. I myself, Dave Bernstein, V.P. of Product Marketing from Electronic Publishing Resources will moderate the panel.

I'd like to introduce some of my colleagues. David Van Wie here, Chief Technical Officer from EPR, will be on hand for questions at the end and so on. Our first speaker will be Eamon Fennessy from The Copyright Group. He's Chairman and CEO. They are based out here in Massachusetts. Kelly Frey on my right, is Director of Business Development for The Copyright Clearance Center, who are based out in Danvers, here also in Massachusetts. And Art Hutchinson, who's a Senior Consultant at Northeast Consulting Resources. He is one of the leading analysts and consultant in the electronic commerce area, and a specialist in something you might have heard of as "future mapping". So that, I think will be an interesting set of speakers and we'll talk briefly about all the issues about copyright in cyberspace.

Kelly, if you wouldn't mind just clicking once over there. For those of you who missed the last session, the whole issue of copyright in cyberspace, comes about because digital content is what we're talking about, where digital information is the product. We're no longer talking about ordering CD's or videotapes and receiving them over the Net or receiving them in the mail. We're talking about distribution of digital information over the Net and publishing scenarios of business information, interactive media, software and entertainment products, delivered digitally over the Net or on digital media such as CD-ROM's and so on.

Clearly, the Internet is a hot topic, but this is an identical problem when you talk about CD-ROM media, satellite TV or cable, when you talk about private networks, such as some of the large on-line service providers, and combinations thereof, where media, where the digital product comes both over the Net and on a CD – something to that effect.

Information commerce, as we've defined it in the earlier session, is a case where we have digital content and there's a way to pay for it. We've enabled some kind of value chain where there are authors, there are distributors, there are multiple rights holders in this scenario, and there's marketing and usage information.

Now what we're going to talk about here is this first bullet item, extensively on protection of copyrights here, because digital products are copyrighted, and we'd all like to

enable the protection of copyrights in cyberspace, so that we truly enable an information commerce industry on the Net.

Okay, then our first speaker in this area will be Eamon Fennessy.
Do you need help with the overheads then?

Eamon Fennessy: All set. Good morning. The Copyright Group is a group that's up the north shore of Massachusetts and what we are are copyright agents. We arrange permissions for people to use copyrighted materials electronically, also translations and other derivative rights.

If I can have that first transparency please.

All of this goes back to the Constitution. And this is going to be pretty basic, but what I'm more interested in with you folks is to let you know what copyright is and then see if we can answer some of the questions that you have applying the copyright law to digital technology and digital commerce.

The forefathers had the foresight to say creations, whether it's a sculpture or imprint or what have you, and inventions, belong to the authors, the creators, for an exclusive period of time. And that's the basics for our copyright law.

The second one please.

While he's putting that up, I'd like to refer to copyright as a bundle of rights. It isn't just the right of reproduction. Reproduction is the first one. But there are also other rights that everybody, whether you're an author or a publisher or a vendor, if you're using materials created by someone else, or being an author, you're willing to license your works to others. You should be aware that there are several rights included in copyright. Reproduction is one.

Derivative works. I mentioned translations, videos, films – films that were based on books – those are all derivative rights, and they belong to the first creator unless they are licensed to someone else.

Third is distribution. That is the right of the copyright holder, himself or herself. And in writing contracts, in writing agreements to license your works, you should be aware of these, and make sure that if you are an author or creator, that compensation is included in that agreement, identifying the specific right that you're licensing.

Fourth is to perform it publicly, and that usually applies to music. It could apply to reading poetry and things like that as well, but that is another part of the copyright.

And the final one is to display publicly. No one can take your work, put it onto the Web without getting your permission.

So I'd like you to keep each of those specific rights in mind, whether you're a vendor, a publisher or an author, because they are valuable pieces of intellectual property, and they belong to you until you assign them away.

I gave a talk in Baltimore on Friday to the Medical Writer's Association, and one of the key points that I stressed with them, is that they should not be selling their rights, they should be licensing the rights. That is, you're giving it to someone for a specific period of time, or for a specific period. First publication rights in North America, for instance, or electronic rights to put it on a CD. But you simply don't sign away your copyright with phrases like "in any form" or "in any technology hereafter to be discovered" or anything like that.

A little story. Back in the 30's there were two high school students name Segal and Schuster. They came up with a cartoon. They sold it in the 30's for a \$130, all the rights to it. And they thought it was terrific. High school kids, \$130 in the depression. The cartoon was Superman, and if they had known what was happening to Superman in the 30's they would have changed their tune I think. But anyway, the rights holder was giving them a fair deal, they enjoyed it and they got the rights that they wanted and the high school students got a \$130 bucks.

Last item is fair use.

Next slide please.

A lot of people feel that they can use someone else's work and just say that it's, "Oh, it's all fair use." And fair use is provided in the copyright law. But when you consider fair use, you really have to take into consideration these issues. There have been several well-known cases: Texaco case, Kinko case, where people have used other people's copyrighted works and using as a defense, fair use. But if you're a commercial firm, take a look at that very issue there about the purpose and character of the work, the nature of the work, the amount and substantiality of the work. You certainly cannot consider fair use and take somebody's entire journal or entire article.

And then the last issue is the effect that your use has on the market for it.

Those are really what I consider the basics of copyright. They were originally set up for print, but they are certainly in the electronic sphere.

I see a hand here.

David Bernstein: Questions at the end please.

Eamon Fennessy: Oh, he wants to have questions at the end, but please don't forget whatever your question is. Um, that's it in a nutshell. Those are the basics of copyright. You have to whether you're a seller or a licensee, be aware of the issues of copyright in the electronic medium. And I'm looking forward to your questions. Thank you.

David Bernstein: Thanks Eamon. I guess we'll need that right-hand screen or projector here again. Okay. Our next speaker, Kelly Frey, Director of Business Development from Copyright Clearance Center. And Kelly, I'm happy to drive that for you while you talk.

Kelly Frey: Thanks. Is there a mic that I can [inaudible]?

David Bernstein: I don't know if there is. It's kind of attached.

Kelly Frey:: Is it kind of attached or...

David Bernstein: It's kind of attached. Why don't you, why don't you come over here and stand at the podium.

Kelly Frey: In the digital world you have to move quickly and so the presentation I prepared last night changed. And I like the comfort of sitting behind the monitor.

Copyright Clearance Center is a U.S. Reproduction Rights Organization. If you can go onto the next slide. We'll go through these quickly. Just to give you an idea where I'm coming from as far as copyright is concerned, we're really the interface between information providers and information users. We're a non-profit trusted neutral party. We represent some 9200 publishers and hundreds of thousands of authors across the world. We license the works of those individuals to some 6200 companies in the United States, including 80% of the Fortune 100. We've had about fifteen years worth of rights management experience. So copyright is our very existence. And the management of the copyright, being able to commercially exploit those rights is what we do for a living.

Next slide please.

A couple of specific interests that our company has. We have an electronic access program. And this is looked at as an immediate solution to a real problem. You have a vast

collection of print material that's out there now. There are no digital rights associated with those materials. What we're trying to do with our digital access right is create a simple scan, store and transmit license, that would allow corporations on their local area networks to take bound items that they have now, and just convert them to digital form. That's not something they can legally do. They need a license for it, so that's what our company is beginning with.

It's a first step. It really allows the type of business usage that you see going on now. So what we're trying to do is legitimize an activity that occurs now. Coincidentally, there's probably some royalty payments that are owed for the use of those proprietary materials and we'll be involved in collecting and distributing those royalties.

We have more general digital commerce interests however. And our interests are not so much involved with what the law is, because the law is changing. What we're interested in is how to use the law to facilitate an effective digital commerce in information. We're looking for supporting technologies that will provide market solutions to the real problems that we have in the copyright arena now. We want to make sure that creators' works are protected, but we also want to make sure that the rights of the users are protected. That they get full use of their fair use advantage, that they have ready availability of very high value content, and also that their privacy and confidentiality interests are protected as well.

We do want everyone to recognize that just because you're in a digital environment, doesn't mean that the U.S. copyright law goes away. This is a very difficult concept for people to get across because in fact, it's so easy to scan something. It's so easy to clip something and put it in an e-mail and send it down the hall. The technology has allowed things which legally are not permissible.

So we need to create situations that will protect the content while making sure that you have the availability of usage of the content.

We're also looking at the availability of technology to implement the various business models that are being created. We've had a print, published paradigm for a long time. We're seeing a transition into digital publishing. But we have to remember that there are economic incentives available to those people who create new works. It's not just a matter of selling technology. We have to blend the technology with the specific content, and the needs of the users in order to create an effective marketplace.

And last of all, we've got a real concern for users of digital materials. While digital access allows many more options than what you have in print, it also allows many more abuses. And you may have seen, if you subscribe to EduCom or their newsletter, a recent blip about a UseNet group tracking postings that are made on UseNet. So in fact, there's availability if you participate in a UseNet group to now go back and actually track every posting that you made to that newsgroup. So we're concerned that those types of information stay within certain bounds, and they're not made freely available, so the privacy rights of the individuals are maintained.

So again, that's more or less where we're coming from. We're very committed to protection of materials using the current copyright laws where there are misunderstandings or where there's confusion, with respect to how the copyright statutes are applied. We would like to look at contract issues that would allow us to resolve those. We're also looking at technology, as being an enabling experience. It's not a restrictive experience. It's not a matter of just protecting content. It's a matter of making sure that content is broadly available to a wide audience.

So I'm looking forward to your questions too, but that's just to give you a background on where our interests lie.

David Bernstein: Okay. Great. Thanks Kelly.

Next speaker, Art Hutchinson from Northeast Consulting Resources.

Art Hutchinson: What I want to do in the next few minutes is outline broader context for how to understand rights management.

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One of the things we do at Northeast Consulting is a version of scenario planning we call “future mapping”. And one of the assumptions that we go by is that the future is inherently unforecastable, but that one of the ways to help understand events as they’re unfolding is to define some extremes.

In this case, what I want to do is define some extremes I call “end-states”. You can think of them as business models for how publishers make money in cyberspace.

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Publishing is inherently a complex and messy environment, and there’s a tendency, particularly in the context of the Web, to think of publishing as being print, but you have to keep in mind that there really are four very, very different parts of the publishing industry, all of which have different assumptions about the way to make money, and different assumptions about their business models. I’m talking about software, print publishing, movies and recording music.

So again, think of these as business models. In essence, the pipes, the networks through which content is going to be distributed – don’t care. Digits are digits. What differs, are the people who are doing the publishing, and their assumptions about how to make money underneath that.

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So rather than starting with the four different business models that already exist in those four different publishing industries, another way to think about this, is that there really are two schools of thought as to how you make money off of intellectual value.

One is that, which is, I think an assumption, again, when thinking about the Web, is that the value resides in an object, in some kind of work. And to go to the example of the Superman comic a moment ago, I think an assumption there on the part of people who are publishing, is that there is some long-term value that you might be able to get out of that.

The other extreme is well, the value, it doesn’t really reside in a work, it resides in an interaction. People preparing your taxes. Certainly, the Grateful Dead believe that people will come to concerts over and over and over again, because they’re each unique experiences.

The next slide please.

And the other way to think about this is that there are two different extremes in terms of the bundling of things that are published. On one extreme, you subscribe to a magazine. There may only be a couple articles over the course of a year that you like, or certainly when I was growing up, I used to buy singles a lot. It’s hard to find singles now. You tend to buy albums. The public music industry, tends to force you to buy albums. It’s harder to find singles. On the other end, there’s the promise and some of the technology that EPR is talking about, certainly holds the promise of allowing content to be “desegregated” into smaller and smaller pieces, and still assuring publishers that they’ll be paid for those pieces. This scares a lot of publishers to death. Taking apart works and allowing re-use is a messy and difficult thing to think about when you’re not sure that you’re going to get paid for all those pieces. And it’s one of the things holding back the multimedia development industry right now.

It’s also one of the issues that the software is wrestling with. Big, complex packages of software, that have all kinds of features that you don’t need. And the object-oriented world, certainly is thinking about the ability in the future to be able to see individual objects.

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When you put these two together, these two spectra together, these are really what I think of as four different end-states or business models for publishing. Time, you think of as a metered interaction with a person. Admission, you can think of as access to an event. How many people got in here without getting past the people in the green shirts today? And you can think of those as protecting a channel, a channel of communication. You're not sure what that channel is going to hold once you get in, but the protection is of the channel.

On the other side, subscription is about access to a work. Here, you're protecting an object. And then usage is about protecting a small work, a piece of a work. Now this is the hard part. This is what hasn't been achieved yet on the Internet, but which is being enabled by some of the technologies that are being released today. EPR is one of them.

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The problem with lighting these conceptually neat packages and business models, is that you immediately start to think of exceptions. You go into an art gallery, well, you're charged admission, but those are works, they're fixed works. Time-based chat room fees, the Deja News that was just referred to is keeping track of all these Internet postings. Well, you thought you were having access to an event, a chat event, but really your chat is now recorded, it's a permanent work. So there's a lot of exceptions here.

And then the final one talks about the fact that you can't cut up works very easily today. Next slide please.

So the business model for charging for time, one of the most important assumptions here, is that information objects are advertisements for an interaction. You'll see attorneys out on the Net who are releasing little white papers about some particular niche issue that, well, it gets them fees. And so the way some people think about making money through publishing, is not through publishing itself, but through generating professional services fees. Consultants and lawyers and accountants make money this way.

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So some of the milestones or indicators that might say we're moving towards a world like this, that there is starting to be more free information on-line – that there is starting to be more spamming out on the Internet – those are really just advertisements for interacting with a person. The use of 900 numbers might increase dramatically. So these are some things that if, if you saw these things happening, it might be saying we're moving towards a world in which the business model was more charging by time.

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So most people don't think about either time or admission as being legitimate business models on the Net, but you can certainly imagine all kinds of fee-for-service applications on the Net where encryption is used not to protect an object, but to protect a channel, or to validate a person's identity, allowing them to have an interaction that's paid for over the Net.

So one of the assumptions under this kind of a business model is, "I'll release all kinds of static works." You can have plenty of copies of this presentation, but what's the valuable part is interacting one on one to work with you on some problem or a private performance, for example.

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So some indicators that might in the future say the world is moving this direction – I like to call this the John Parry Barlow end-state, you know, that bootlegging and copying is encouraged, because then you'll come to the concert. You'll want to experience the real event.

So next slide please.

So the two end-states, the business models that I think are most interesting right now, in terms of publishing on the Internet have to do with subscription and usage. And subscription is really a huge bucket. I don't just mean subscription here, but everything from books to

magazines to albums. Anything where physical protection is the main means of copyright protection. People think that they're buying an object, and what they're really buying is the right to use that property, but it's physically protected on a CD or in a piece of paper.

And the assumption here is a dangerous one on the Internet, that the stuff – there's a little bit of copying we'll charge to allow for that, but that copying is never going to be enough to destroy the business. Well, that changes as soon as you get out on the Net, regardless of the legal restrictions. I routinely receive anonymous re-mailer messages on various newsgroups I subscribe to that are postings of articles that appeared in major magazines. Anonymous re-mailers on the Internet certainly poke a hole in that, and again, it scares to death the publishers. There's a tremendous volume of content that's out there. Various estimates put it around an order of magnitude – you just count bits, you count terabits. An order of magnitude difference in the amount of stuff that's out on the Web now, versus the amount of stuff that's in the databases of folks like Lexis-Nexis or West Publishing or folks like that. So the problem here is that you can release this stuff on the Net and get paid for it.

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So some indicators that we're stuck in a subscription world, or we're moving more towards a subscription world would be, that traditional publishers continue to thrive. There is no disintermediation, that the flood gates of content don't open and go out on the Net, that there continues to be a tax on blank tapes, for example. The legal emphasis remains on physical objects. And that softer products and music and all kinds of content remain very much bundled. You can't buy just the word processor core. You have to buy the whole thing.

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So finally, usage, and this is where the term, the dreaded term "metering" sometimes come in. This is the promise of being able to protect and dictate the terms for an object, however small that object may be, be it a sentence or a song or a piece of a song. And one of the things that people forget when they hear the term metering and start thinking about usage, is stuff that's free now doesn't necessarily have to not be free if you protect your rights to it. That you can put things in digital envelopes, encrypted digital envelopes and dictate the terms for those without necessarily having to charge for them.

One of the assumptions in having this end-state occur is that there have to be standards for this. Think of this as envelopes for digital content, in the same sense that we have standards for having stamps in the upper right-hand corner, and return addresses in the upper left-hand corner today in the physical world.

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Some indicators if we are moving towards this world would be that the flood gates open. There's an increase by an order of magnitude or so in the amount of content that you can find out on the Net because objects would be encrypted. You don't have to worry about protecting the channel. You don't have to worry about protecting access anymore. It enables something – the term super distribution – that you don't care anymore about protecting who gets your work, because once they've got it, they still have to open an envelope and agree to terms and pay for it.

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To summarize, some of the keys differences between subscription and usage is that moving from a subscription world to a usage-based world, means moving from legal protection of copyright to technological protection of copyright. No longer do you have to worry about whether somebody is doing the right thing, and whether they're moral enough to not use an anonymous re-mailer. The object itself is protected.

And we're also moving from physical protection to virtual protection. You're protecting software, protecting an object, a digital object, rather than protecting a warehouse full of videotapes, or a warehouse full of floppy disks.

The other thing that's interesting, certainly extremely interesting to publishers, is the difference between these two worlds, the potential for feedback.

In a subscription world you know as a publisher that x-number of people bought the March issue of your publication. The promise of usage-based measurement metering is that you might know that this article, this particular article was read by this particular person on this particular day for this number of minutes. Well, that's scary. That's really scary. But there are some ways short of that, that publishers can get a tremendous, tremendously richer stream of information about how their content is being used, such as you know at least that this particular article was the most popular article in that magazine because it was read by x-number of people. So you can start as a publisher, one of the things this enables as a publisher, is to get feedback about what content is working, what content is not working, and to tune your creation of new content to the needs of your marketplace.

Um, the other thing to understand about the difference between these two business models, these two end-states is that in the subscription model, relationships are very formal. Distribution relationships are formal. Distribution channels are inherently constricted. Whereas, as I said earlier under super distribution, the promise certainly is to have an infinite channel. People put things up on the Net and they succeed or fail on their merits. People send things to their friends. It's the classic case of the comic strip producer that was mentioned earlier, who puts their content up on the Net and people download it and pay a nickel for it every day, and they develop a following.

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So one question you could ask would be, "So how are these four publishing segments going to evolve in the future?" Um, but that's an easy question because it's already fairly clear how some of them already are evolving, that software is evolving more towards a usage model, or more quickly anyway, and that film and recording, well, they kind of straddle a subscription and an admission model.

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So I would say the better question to ask is, "How do these different business models come together in the future?" Because one of the things to understand about the technology's underlying usage metering, is that if you can meter at a very granular level, if you can protect content at a very granular level, you can always aggregate up. You can always simulate a subscription model. You can always simulate all of the other business models, but you can't go the other way.

So metering is about creating a richer range of protection and payment mechanisms for a variety of different publishing industries, and it will be interesting to see how it evolves. Thanks.

David Bernstein: Okay. I think we've heard from our speakers, and maybe if we can bring some lights up. As promised, we want to make available this panel of experts to you for questions. So let's get some lights perhaps if somebody knows how to do that. And we'll take questions in the dark for a while. The front? Second row? Yes, you.

W: I was curious about how, I don't know if they're called primitive works or not, but things like parody and secure hold, things were covered under copyright laws.

David Bernstein: Okay. The question is, "How are satirical works, parodies covered under copyright laws?" And by the way, if you have a particular panel member you'd like to address your question to, please don't hesitate. Anyone want to try that?

Eamon Fennessy: As a matter of fact, can you hear me? The issue of parody came up, oh, within the last six months in a group called, I think, Capitol Steps down in Washington, who parodied so many popular tunes and of course, directed towards the Capitol and to the legislature and to the rest of it, but there have been other instances where people have parodied, parodied well-known tunes, put their own words to it and it's always been thought that that was strictly illegal. But the most recent cases have filed that, "No, as long as it's, whether it's educational or just entertainment or however the courts decided." That really has been a blow to the rights holder, that people can parody things and get away with it. That refers to the performance of copyright issues.

Kelly Frey: One other thing to note that a lot of times, people are concerned with whether a parody replaces the original works. For example, in the recent Supreme Court case were it involved a 2 Live Crew and Pretty Woman parody, you know, the court basically said, "Look, there's not a big audience between the same people who would buy the rap music and would buy, you know Roy Orbison." So it's really not replacing the market that was originally intended to. So it was very heavily fact-based.

David Bernstein: The front here.

M: Yeah, it's a question about something that was brought up by a couple of panel members with the UseNet history. Um, so to make the question make sense, I'm going to give you my basic understanding. You tell me if I'm right or wrong. It has to do with, we learned about the rights of copyright, but we didn't hear about what the copyright holder has to do to ensure retaining those rights, protection of those rights. And a lot of the confusion about copyright on the Internet, I believe, comes from the fact that one of the basic tenants of copyright, as I understand it, is that you have to make an effort, a concerted effort to protect those rights and not allow anyone to use them. If you don't make that effort, then you're considered to have released your works in the public domain. And since distribution on the Internet necessarily, well, until the Well, even with WorldWide Web, since distribution on the Internet necessarily involves releasing your work to be copied on an ad hoc basis among multitude of machines, the electronic equivalent of putting out ten or twenty thousand paper documents without taking proper steps to ensure who's going to use them and how they're going to use them, that you might in fact, be relinquishing your rights by doing so.

David Bernstein: Okay. Let me try and summarize for the audio tape here. The question was, do you need to do anything special to retain copyrights, and because that's really hard to do on the Internet now, are you essentially forfeiting your copyrights by releasing content on the Internet? Anyone, any panelists like to... Eamon?

Eamon Fennessy: Yeah. With regard to anything you have to do to protect your copyright, the copyright law is that from creation you have a copyright that lasts fifty years beyond the death of the author. Fifty years is a long time. In the European Union, it's seventy years, and there's been legislation introduced in this country that will make our copyright also seventy years. That's not moving right now. So there isn't anything you really have to do to protect that

copyright except, if you see somebody really abusing your copyright and infringing on it and making money from it, sue them. Maybe Kelly, do you have anything to say about that?

Kelly Frey: Well, yeah. It's very important to note that you don't have to do anything in order to establish your copyright in the United States. All you have to do is create something. And as Eamon said, from the moment of creation, it's protected. Now there's some other things you can do. You can register your copyrighted work with the copyright office, and that provides you with some additional remedies under the federal statute. You can sue in a federal court. Your copyright registration is [prima facie] evidence of your ownership. You get statutory damages. You don't have to prove that you've been damaged. There's a minimum \$500 statutory damage if you go ahead and register your work. So there are some advantages. But as Eamon said, the critical point is, okay, so somebody's copied your work. Now what are you going to do about it? Our judicial system is really based on trial by combat. You know, if you've been offended, you've got to assert your rights in a civil sense, so you have to file a law suit. If you don't, nothing happens. The government's not going to take the place of you as an individual civil complaintant who's got some sort of injury, as a result of somebody else using your work.

David Bernstein: But the question was, even if you don't do anything, you still have your copyright?

Kelly Frey: Sure.

David Bernstein: Okay.

M: There's no precedence established by letting one person infringe, and then you decide to pursue a second person. If the second person can't say, "Since you let the first person [inaudible] pursuing them," I have in fact a right?"

Kelly Frey: There's nothing under the statute like that, but there are all sorts of common law defenses. And let's remember, the copyright statute says you may not copy period, right. And then it lists all these exceptions. Fair use is an exception. And it also has some defenses as well. And there are common law defenses. Latch is a common law defense. If you wait too long to assert your right, you lose it. All right? But that doesn't have anything to do with the copyright. It's the same thing is, if you ran into somebody with your car, if you don't sue them within a reasonable amount of time, you lose the ability to do that.

Art Hutchinson: But I think one of the other things that's an issue here, is that it would have to be a pretty valuable UseNet posting to motivate somebody to go through all this legal process to recover their rights. And I think what's at issue here is not that there are not legal and moral systems in place to protect this, but that the technological means for protecting this without having to incur heavy costs, are not yet in place. They will be coming into place. But for the moment, there's tremendous confusion when you go to post to a UseNet as to "Am I engaging in a conversation or am I publishing?" Where's the line between publishing and speaking here?

David Van Wie: I'd like to add just a little bit to that. One of the key constraints in designing any kind of technical measures to help owners and rights holders enforce their copyrights, is to take into account a distributive model. When you're working in the Internet, it's very important to go ahead and map your technologies right onto the existing topology of the Internet so that you

have a real distributive model, rather than attempting to put in place a centralized scheme. So I think you brought up a very important constraint from a technological point of view.

M: The [inaudible] from The Copyright Clearance Center mentioned 9000 publishers and 6200 corporations with whom you deal. Super distribution [inaudible] whenever using that user might not be a publisher, certainly [inaudible]. You're going to have to revolutionize his business I assume.

David Bernstein: I'll try and re-phrase that question a little. The comment was that the CCC has 9000 publishers and many thousands of other participants in the copyright area. When we go to a super distribution where, or on the Internet, where, with the technology such as Digibox, everybody can become a publisher, essentially, or creator, how can we handle millions and millions of copyright holders? Well, I think your conclusion is correct. We will have to revolutionize the way that rights clearinghouses and so on work. And EPR, for example, has announced, in an relationship with CCC to do just that. So that's what's going to happen.

[Tape change]

Kelly Frey: It's incremental like every other type of business so, for example, while we have a current business, we're looking forward to participating in tomorrow's economy as well, and that may mean that publishers or authors have a responsibility too. Maybe they need to register, so we'd have a Web site now, and we're getting ready to say, "Okay, if you as an author want to register something, sign-on to our Web site and register it. And we'll represent your interests as well." But you're right, technology is going to have to take the place of the handshakes and the paper contracts that have been signed over the last two hundred years.

David Bernstein: I mean after all, there are millions and millions and millions of credit card users. There's no reason we can't have millions and millions and millions of copyright situations. Yes?

M: Isn't there a difference between publishing in discourse? Now when we're talking about UseNet, aren't we talking about people interacting with other people in dialog and shouldn't, shouldn't that be a... What's the difference if, if I'm a reporter, and I'm sitting in this room copying down quotes from any of you gentlemen and I put it in the newspaper, and someone tracking all of UseNet so that a reporter down the road could do the same thing?

David Bernstein: Let me try and re-phrase the question and start with a brief answer. Others can kick in. Question was, "Isn't there a difference between discourse and publishing?" I think of course, there is. The key issue here is if somebody wants to, to protect a property of theirs, that's currently really hard to do on the Internet. And I don't think the question was so much in the UseNet groups necessarily protecting discourse, but people were actually posting to UseNet groups, actual copyright works of papers that had been written. So I think sure there's a difference. And perhaps there's a difference in the law on discourse versus... If one of you could address the gentlemen's quotes or question of regarding his writing down our quotes and publishing them.

W: Well, usually copyright will not apply to ideas. In other words, if you have an idea about how to make your Home Page or something like that, it's not really protected until you put that into a hard copy, or put it on some medium. So if you have it on UseNet and you attribute

some ownership to that, you can very well try to enforce a copyright on it if it's your creation, but very difficult. I don't know what, what more to say.

Kelly Frey: I think it does demonstrate though a matter of convergence. We're not just talking about copyrights, and we're not just talking about print publishing. You know, we're talking now about maybe a media that has characteristics of print publishing, some characteristics of broadcast perhaps, some characteristics of newspaper publishing. And in fact, it's not only copyright, but their first amendment rights, their defamation rights potentially. I mean, I may not care if you copy down what I say, but if you attribute some scandalous remark to me during the presentation, I feel like I should have some right to come back and have some recourse against you. So, you know, there are a whole bundle of rights. Copyright's only one.

Art Hutchinson: I think one of the other issues, the thing that's at issue here is reputation versus creating a work. That a lot of people will create quote unquote "works" they post to the Net, and their sole interest is not protecting those works, but developing a following in whatever community they want to develop a following – associating good thinking with their name or good guitar playing, or whatever it may be – they're not interested in protecting the small things that they produce on the Net, but protecting their reputation and their name and getting people to follow them later on.

David Van Wie: Part of the sorts of rights protection technologies that Dave and I were talking about earlier in that realm, is strictly to protect the integrity of your works, which I think speaks directly to that reputation issue, so that even though you're not charging or any other economic variables, you do want to ensure that your work hasn't been modified or falsely attributed to you, which either of those could be significant enough to use these sorts of technologies.

David Bernstein: That's pretty important when it's financial data or stock quotes or business data, you want to make sure it's what it purports to be.

David Van Wie: That's right.

David Bernstein: So... In the front here?

M: Yeah, when you talked about how different companies are now tracking what you post on UseNet, and talked about copying various bits of quotes from UseNet, what about using UseNet as a creation in and of itself? I mean, suppose I go onto different UseNet groups and take chunks of chats and publish it as a book. Or as Hot Wired and the company I work for, Prodigy, which will sort of be doing, taking a derivative work and doing sort of like a Talk Soup type of thing, where you take different sort of portions of UseNet and you do sort of like a funny column about it or something. I mean, if you're creating something that you then copyright in and of yourself, either as a book or as a publication on the Net, can the people who originally posted those notes come back to you and say, "Well, I didn't give you permission to use my work in this way."

David Bernstein: Let me try and summarize again for the tape. The question was, "What's the implication if there's a chat or UseNet group or somebody posts a whole series of answers to facts, frequently asked questions, and then later on, somebody else summarizes, like a Prodigy or another service would, they'll go ahead and take that whole result of that chat or that whole

newsgroup, publish it as a separate on-line book, magazine or a print publication, what about the rights of the initial people? Could they come back and say, "Hey, I didn't give you permission." What are some of the implications there of the various contributors? Eamon?

Eamon Fennessy: Yeah, I think that really goes back to the slide that I had, the transparency on fair use. Are you going to charge for it? If you recall, the fair use was, the factors to consider in something like that if you're putting it together, what sounds like an anthology, the purpose and character of it, is it commercial or non-profit? The nature of the work? Well, it's available to a whole lot of people. That's probably not a problem. The amount and substantiality of that work? You have to consider these if you're going to put them together and take them from the Net. And then are you going to give them away? Is it going to be a charitable publishing endeavor, or are you going to charge for it? And then the effect of it, of that on the potential market. Probably the people whose works you're taking did not intend to sell it themselves, so that wouldn't be a consideration. But the fact that it is in a medium, which can be recognized, really makes it subject to the copyright and you have to consider that if you want to publish someone else's works.

David Bernstein: I'll tell you that, to give a relevant example. Those of us up here today all signed a release regarding our current participation in this conference, so that the people who put this conference on, could do exactly that, publish an anthology or conference proceedings as it's known. So I think you know, for those of us who do contribute a lot to things like this or on-line discussions, you know, we're used to signing releases. And I've actually done that in on-line conferences, when you join a conference that's you know, going to be, have a record and a transcript published, you in essence sign a release at the start. So you...

Art Hutchinson: There may in fact be a change in that power relationship though in the future that if you are able as an individual posting to a group to make very specific terms about how your posting can be used before you put it up, attaching those terms to a cryptographic envelope that surrounds your posting, well, that's very different than signing a release before and signing all your rights away. So that you might post something that says, "It can be used for any purpose except an anthology. And if it's an anthology, it's going to cost you x-dollars to open this up, or you must phone home to this provider to arrange payment."

Kelly Frey: And one more thing, let's not deal with this in the abstract. Let's deal with it practically how it's going to affect you. This is the question – "Do I have to do anything to protect my rights?" It's the cumulative liability. Over time, the more you do it, the more people you include, the more exposure that you get, the more likely you're going to have someone who's disgruntled because you're making money, and they're not, and you're using their material.

David Bernstein: Way in the back there. Thanks for your patience, keeping your arm up.

M: A lot of Web sites have directory areas and business sites which allow you to link directly into other sites. When you place those links into your site, are there any legal issues?

David Bernstein: Okay. The question was, "On Web pages, if you place links on your page, are there any legal issues associated with, with having those links on..."

M: Or permissions. It's seems it's pretty widespread [inaudible]. The precedent is there's no permissions needed.

David Bernstein: Do you need to have permission to link to somebody else's site? Anyone want to take a shot at that?

Art Hutchinson: I've just observed that in some of the companies we've worked with, that has been a hot topic of debate. On one end of the spectrum, a company's legal department was extremely fearful that they would be in effect, endorsing all the content on the other site, and that would lead to some kind of liability. At the other end of the spectrum, a biotech firm we were working with actually measured their marketing people on the number of hotlinks that they managed to put on a Web site in a certain period of time. That was their primary goal during that quarter was to get the number of links up to a large number. So I think it has more to do with corporate culture. I'm not sure I could speak to the legal question though.

Kelly Frey: One thing you might want to be careful of though is the defamation aspects. How many of you have surfed babes on the Web?

M: [inaudible]

Kelly Frey: Okay. All right. Excellent.

David Bernstein: Can we get a comment from you on that?

M: Oh, I...

David Bernstein: What was your question?

M: My question was actually going to tie into this. I really [inaudible]. I've had legal threats against me and every one of them have failed. And basically because there is no defamation on my site. And I think [inaudible], that if you have a link available on the Internet, you're requesting somebody to link towards you. I mean, you're making yourself freely available. To me it's the equivalent of bibliography intrigue or [inaudible], being able to reference someone else's work, as long as you are within that area, not defaming character [inaudible].

Kelly Frey: Right, yeah. Your links are names, but you know, if they said, "Here's a nice Nazi." You know, or...

M: Right. We don't say that. [inaudible]. Now that might be defamation of myself [inaudible] articles, but to no one else the data really is in violation of character. It might be in bad taste, or it might be in just moderate taste, but there's no legal aspect about it. It's been thoroughly researched by the American Bar Association and [inaudible]. My next question I have is...

David Bernstein: Okay.

M: Regarding, say I want to design a page that has all the comic strips on the Internet that change on a daily basis. I'm not going to store any of those documents on my server. I'm going to write a HTML file that says, "For view of browsers, refer to this different site and retrieve

that graphic.” Am I violating copyright in that situation? I’m not storing the image. I’m telling the browser to retrieve the image from a different server.

David Bernstein: Okay. The question, just to re-phrase for the tape was, “If I create a page that has links to a bunch of other comic strips which change on a daily basis, or other copyright, and those include graphics, am I violating any copyrights or other issues, even though I’m not storing any of the materials, just links?”

M: I’m making references.

David Bernstein: You’re making references. Anyone want to comment on that?

W: I would say that you’re probably all right. I can’t think of any reason that someone who has material on the Internet and you’re simply referring other people to that, I don’t think they’d complain at all.

M: Well, I’m basically requesting their browser to bring up that graphic, so I’m actually causing a mode of distribution for that image.

David Bernstein: Yeah, but...

M: But that image is coming from that source. Is that a violation from me to control their distribution?

Kelly Frey: I think your primary problem there is being a co-conspirator. You know, if you’re directing people to a site that actually has unlicensed copyrighted material and your...

M: This is from the original site.

Kelly Frey: Right. But I’m just saying, if you’re directing people to a site that has material, and you know that it’s unlicensed and it’s not that owner’s, and you’re selecting and getting a fee for that, you know, I think that there’s a good argument that could be made that you’re a co-conspirator and in a copyright violation.

M: But if I’m going say from United [inaudible], and I want to display that on my personal Home Page but also [inaudible] the image, I shouldn’t have a problem, correct?

Kelly Frey: I don’t see one.

M: I don’t see one.

M: [inaudible]. They put that comic strip on there so that people will come to their page and click on that ad, and then he sets up his page, grabs the comic strip, does not grab the ad?

David Bernstein: Okay. The question is, “Suppose the page with the comic strip had advertising in it, and the previous gentlemen’s link was directly to just the comic strip, just the sub-URL for example, then what’s the issue there?” Boy, now this is getting interesting.

Art Hutchinson: You're facing the same issue that broadcasting is facing right now. Do you put the ads between segments, or do you put the ads along the side of the screen? Is there a way to link the two together? Create permissions that surround the entire entity of the comic strip plus the ad? A lot of different ways to work that one.

David Bernstein: From EPR's perspective, you put the ad and the comic strip in the same container and there they stay. But... In the back there.

W: What constitutes new use of publishing material? [inaudible], you can essentially keep it there for three years if you want, but three years from the date that you [inaudible].

David Bernstein: I guess the question was, "What constitutes new use of material?" In summary, right? Someone have a shot at that.

Kelly Frey: You have all of the copyrights as soon as you create that material. You can license out certain portions of rights, either for a specific time or for a specific use, but you maintain the rights over time unless you give them away or sell them to someone else or license them to someone else.

David Bernstein: Okay. Well, unfortunately, I think we're even five minutes over our time, although there's still questions left. I think all of us will be around afterwards for some questions. Thanks so much for attending these lively topics on electronic publishing. Enjoy the rest of the show. Thanks.

PUBLISHING ON THE INTERNET ON-LINE NEWSPAPER SERVICES: WHERE THE INDUSTRY IS HEADING



MODERATOR
Walter Chavez
Web Developer, iWORLD

SPEAKER
Steve Outing
President, Planetary News, LLC

Walter Chavez: Good afternoon, ladies and gentlemen. My name is Walter Chavez. I am a Web Developer with iWORLD Mecklermedia's site on the Web, and it is a pleasure for me to welcome all of you this afternoon to our afternoon session on on-line publishing. [Our] speaker will be Steve Outing, President of Planetary News. Mr. Outing will be talking to us about "On-line Newspaper Services: Where The Industry Is Heading."

Mr. Outing is an on-line publishing consultant, and at the same time he writes a 5-day daily column which is available on-line. He'll develop on that a little bit, so without further ado, Mr. Outing.

Steve Outing: Hi, thanks very much for coming. As Walter mentioned, I am an on-line publishing consultant, kind of specializing in the newspaper industry. I have worked in the newspaper industry for about 16 years before getting interested in Internet stuff.

So, what I thought I would do is just tell you a little bit about the growth in the business, which has been pretty dramatic, especially in the last year. I'll probably spend a lot of time talking about revenue strategies that various publications are taking, and I'm going to talk a little bit about alliances, which you see a lot of.

I just want to start by giving you a brief overview of where we're at in the newspaper business in terms of on-line services. The statistics will show that publishers nowadays have quite a bit of companies on-line and especially on the Web, so this chart dates back to 1982. Back then there were about three newspapers that were experimenting with on-line services, all of them in the U.S. They were like simple BBS systems. In fact, the oldest one, The *Fort Worth Star Telegram*, is still operating as a BBS today, although it's making the transition to Web Service. So as you can see, the idea of on-line newspaper services never really caught on during the '80s. These were text-based systems, no graphics, very slow modems; so until the '90s it really wasn't much of a viable business.

Things finally started getting interesting for newspapers in about 1993, and I track all these numbers for *Editor and Publisher Magazine*, which is where they all come from. In 1993 there were about 20 newspapers with on-line services, and what we saw in that year was quite a few alliances with the major on-line services. The *Chicago Tribune*, for example, created a service with America Online.

Things really started to heat up in 1994, where by the end of that year there were about 100 newspapers either operating or developing services. What we saw that year was quite a few alliances with the on-line services, especially Prodigy. They signed up the Times Mirror chain, Media General, and Cox Newspaper chains. The plan, then, with all of those papers that logged on with Prodigy was to create services on the Prodigy "Legacy Platform." Today, what's happening is some of that is being scaled back, and a lot of those services are now going to the Web instead; some of them will be working at Prodigy, and some of them will be doing it on their own.

And then in 1994, of course, that was also was the year that the Web really came into public consciousness and newspapers started to realize that it was a pretty hot thing.

So on the last bar over here, showing 1995, the growth has been pretty phenomenal. It's grown more than fourfold just since the beginning of this year, from 100 at the beginning of the year to about 540 newspapers worldwide today that are operating some sort of on-line service. So the herd instinct worked in the newspaper publishing business.

I would expect that by the end of this year we'll probably have about 800 newspapers doing some sort of on-line service, and by the end of 1996 I wouldn't be at all surprised to see about 2,000. So the business is really sort of coming out of the experimental, infant stage into toddlerhood.

Where up until now a newspaper company might have just allowed, say, one of its papers to experiment on-line, what we're starting to see now is the newspaper chains putting all of their properties up. Knight-Ridder newspapers is a good example of that; they operate about 28 papers in the United States and they've funded several projects for a couple years now, like the *San Jose Mercury News*, that you're probably well acquainted with. They have a service on America Online and the Web that's been going on for a couple years, and they recently bought 50% of an Internet access provider, InfoNet, and so probably all of their papers will go up within the next year.

Another group, PAFET, which stands for Partners Affiliated For Exploring Technology, comprises six sort of medium-sized U.S. newspaper chains. They're working on strategies to get all of their papers on-line.

Those were some larger newspaper companies. Now, what we're starting to see both in the U.S. and in Europe are groups of community newspapers going on-line. In San Jose, California for example, there is a group called the Times Newspaper Group, and they've got all of their six little community papers that serve different neighborhoods of San Jose on-line.

This slide is Pioneer Press Newspapers in Chicago, and this just came out a couple of weeks ago. They put all 47 of their papers on-line.

Let's see... Overseas there's also a joint venture in Sweden that a little later this year will put about 53 of its newspapers on-line.

The point here is that it's justified in that chart that I just showed you that we're really going to see a lot of growth next year.

Now, I fully expect on-line services run by newspapers to kind of follow a similar track to what the industry did with audio text. This chart shows figures from the Kelsey Group Research Firm out of New Jersey, and it's just the North America market and its interactive services operated by newspapers. The bulk of these numbers are audio text, so on-line is still a small portion of that; probably the next audio text experience in the newspaper industry will give us a good idea of what to expect with on-line services.

With all these wildly optimistic growth charts that I've shown you, I also wanted to just point out that probably in 1996 we will start seeing more publishers either scale back or possibly even kill some of their earlier experiments, and we're starting to see that now. This was the *Utne Reader Magazine*, which just a couple of weeks ago announced that it was scaling back its on-line presence. And in the newspaper business, both the *Los Angeles Times* and the *Milwaukee Journal Sentinel* in the last few weeks also significantly cut back the staff that they've devoted to their on-line services.

The *L.A. Times*, for example, had built up a pretty hefty staff of about 44 people, and trimmed it by 50% just a couple of weeks ago; they're transferring that over to a strictly Web-based service.

In Milwaukee what they were able to do — they're still going to stick with Prodigy at least for the time being — but they were able to cut back from about 16 to 9 people primarily

because they were able to automate a lot of the tasks that had required a lot of labor. I expect to see more of this going on in the next year.

Oh, part of the reasons for the Milwaukee paper needing to cut back was that they only had, I think, about 1,400 subscribers to their service — which obviously is not enough to support a staff of 16 people.

So, obviously the on-line service business is pretty competitive, and I think we'll see a little bit more of this. But I still remain pretty optimistic that the trend is still going up.

In the newspaper business, they're starting to figure out that the Web is pretty significant. This chart goes back to 1994, to when I said there were about 100 newspapers doing some sort of activity, and about half of them were on the Web. About 35% were affiliations with the major on-line services, and then the balance were dial-up BBSs that would not be accessible via the Internet. Actually, if you looked at this chart in Europe you'd see that nearly all of the activity was on the Web, so the BBSs and commercial on-line services alliances tend to be a U.S. phenomenon.

Okay, so this next chart is what it looks like today, and clearly the Web is the dominant force in on-line newspaper publishing right now with about 84% accessible on the Web, 9% affiliations with the on-line services and then 7% dial-up BBSs. Now, what this chart doesn't show is that there is also quite a bit of overlap, so many of the newspapers that are operating on the on-line services will also have a Web site. That's pretty typical. *San Jose Mercury News*, for example, has been on AOL for a couple of years, and they also very early this year launched a Web site.

The *Atlanta Journal Constitution* is on Prodigy, but they're also doing some pretty ambitious work with some Web sites that are already up that will deal with the 1996 Summer Olympics.

The *Arizona Republic*, that's kind of interesting, they've got a few Web sites up already. They are one of the few newspapers this year that actually signed a deal with one of the major on-line services, and they will be on America Online a little bit later this year.

What you're seeing with those papers on Prodigy is that they all are slowly migrating over toward the Web, so their content will be accessible by anyone probably in another year or so. With all those newspapers on Prodigy, their content will be accessible on the Web, and not just to Prodigy subscribers. And as I'm sure you're hearing at other sessions here, that's sort of the trend for all of the on-line services — to open up to Web travelers.

On the BBS side, most newspaper BBS systems currently either offer or plan to offer WorldWide Web access to their customers. So, in effect, some newspaper BBS operators have become Internet service providers for their communities. We're not seeing a lot of those, but a few of them. Indeed, there are still a few newspaper BBSs operating out there that don't access the Web yet, but I don't think those are going to survive long-term.

Actually, a good example of this is the *Kansas City Star*, which since last year had been developing a proprietary BBS system. The original business plan was to launch it with just minimal Internet connectivity, probably just e-mail, and the idea was to add Web access a little bit down the road. What they discovered during beta testing was that wasn't nearly enough, and their users told them that in no uncertain terms; so what that newspaper is doing is that they just recently cut back their BBS development, lost a fair amount of development work and are now building a Web service.

I was going to talk a fair amount about revenue strategies that the different papers are taking, and one that seems to be gaining quite a bit of popularity is that newspapers are going into the Internet access business. I mentioned Knight-Ridder Newspapers and their partnership with InfoNet in Virginia; the *Philadelphia Enquirer* and the *Miami News* will probably become Internet service providers in another year or so, and if you're in one of those communities

you'll be able to buy an access account. It will be like the Philadelphia Enquirer/InfoNet ISP, and they'll charge you probably \$20 a month for an account.

Some newspapers are doing that alone. An example of that is the *Arizona Daily Star* in Tucson. They've been operating as an ISP since May of this year, and they did the whole thing independently, which is fairly unusual. They currently have about 2,700 paying customers who pay \$20 a month, and that [monthly payment] gets them unlimited hours. So, they're actually doing pretty well. Their business plan was that they expected to have about 1,500 subscribers by the end of this year, so they're already well ahead of that; and they had projected that they would break even at about 3,000 to 3,500 subscribers.

As I said still, it remains to be seen whether a newspaper company can be successful with their newspaper-branded Internet access service when some of the giant competitors come along, and you've got U.S. West, Ameritech, AT&T, and some of the upstarts like At-Home offering Internet access accounts. What I tend to recommend to publishers is that they not try and go it alone, and they're better off allying with a provider like InfoNet that I just mentioned.

I'm watching closely the launch next spring of At-Home, which is a venture-capital funded cable television industry startup that is going to bring a 10-megabyte per second Internet access to American homes. I kind of wonder if a newspaper like the *Arizona Daily Star* is going to be able to match the challenge of something like At-Home.

I still will recommend to some publishers, depending on the market, that there are some opportunities in the access business, but it's not a universally-loved idea. A colleague of mine, [Rosalind Resnick], who is a fellow on-line publishing consultant, in her *Interactive Publishing Alert* newsletter in July wrote an editorial recommending that publishers definitely do not go into the ISP business. I just thought I would mention that if you're a publisher out there and you're thinking about this, to maybe get the other point of view.

I think the main thing that I wanted to talk about was the various ways that newspaper publishers are trying to make money on the Internet. My most frequently asked question is, "What publisher is making a buck on the Internet right now?" And it's really tough to find any examples of that, which is still just now coming out of their experimental stage.

So, let me just go through a list of various ways that a newspaper publisher can make some money on-line. As you'll see from this list there is certainly no shortage of strategies, but no one of these is really going to make you wildly successful.

The first one on my list, which we've just talked about, is ISP revenues.

Second will be subscription fees. An example of that is the San Jose Mercury Center. On their Web service the model is that anybody can see the sites free, but for the full content you have to pay a subscription fee; and if you subscribe to the print edition it's a dollar a month, and if you're not then it's five dollars a month. I think they've been moderately successful with that. They have, at last I heard, a few thousand people paying them.

Another revenue source is premium service fees. What you see a lot of them do is charge for access to newspaper archives, maybe like 50 cents a search or something like that.

Personal news clipping services. *San Jose News* has something called News Hound, which I think they charge \$10 a month for, and that will deliver articles from their various databases into your e-mail box. Actually, with the News Hound technology, you'll start seeing that on other on-line newspapers that are affiliated with Knight-Ridder or InfoNet.

Paper "click" content. I've heard that talked about at various other conferences here the last couple of days. You might want to charge, say, 50 cents just to view a certain report, or a few cents to access one of your databases that you have on-line.

Classified advertising. What I see a lot of papers do is they'll charge an extra dollar per line for a classified ad placed in the print edition, and that'll get you onto the Web site. I notice

this a lot with some of the smaller papers, where what they'll do is just raise the classified ad rates wholesale and then use that money to help fund the on-line service.

Enhanced classified advertising. Here a paper might charge an extra fee to put up a photo of a house, a photo of your car, that sort of thing. What you see a lot of them doing is offering deals to realtors, employment agencies or other dealers, and that gives the advertiser the opportunity to put their entire inventory of ads on-line rather than just a handful that would go on to the print edition.

Personal ads. The newspaper industry has been doing stuff with interactive personal ads for a long time, generally via voicemail-type stuff. Now they're all starting to port that stuff over to on-line. What they might do for a revenue source there is charge for enhanced ads, like charge if you want to put up your photograph, maybe a video clip or an audio clip of yourself talking, that sort of thing. This is kind of interesting. What I'm seeing is that some of them will set up a system where they will charge, say, 50 cents a message for two parties; once they find each other on one of these on-line personal ad systems, they'll charge for anonymous e-mail sort of as a safety measure. Once the two people who find each other in personals find that okay, maybe we want to exchange phone numbers, then the newspaper gets out of the loop and is no longer bringing in money.

Of course, advertising is where most publishers expect that they're going to make a lot of money on-line. I try to break this out into several different revenue streams; the first is just basically selling links to an advertiser's site, and the advertiser's site might be on a remote server or it might reside on the publisher's server. There are lots of opportunities for placing on-line ads in services like this. Obviously, with the news pages that they operate, a lot of newspapers have created niche services. We're seeing a whole bunch of golf services out there right now being done by newspapers, so that obviously is a nice little advertising vehicle.

We're seeing a lot of "event-centered" Web sites pop up. The Olympics, for example; I mentioned the Atlanta paper. Probably next year we'll see a bunch of those go up.

Topical Web sites. Some examples of that would be where one of the papers in Florida has a hurricane Web site that operates all through the storm season. Other sort of topical newspaper sites have popped up around major sports events, celebrated trials — I think there were a few O.J. sites out there — and this one is kind of interesting, we're starting to see a lot more newspapers put up community databases. So, this might be like putting a school test score database on-line, or putting up the local crime statistics and then allowing on-line users to find out the crime statistics on their block. So that also offers another sponsorship opportunity, like the school test scores that might be a good opportunity for, say, a realtor to sponsor.

That all came under the category of selling advertising space.

The second part of the advertising equation is actually hosting the on-line ads on your server, sort of renting service space to the advertiser so that you can get a separate fee for that.

The third component of the advertising thing would be to set up a Web site "construction and design" business. I'm starting to see more and more newspapers do that.

I should have kind of mentioned this before, but it's just the idea of selling sponsorship as opposed to just selling ads. An example of that was one of the Virginia papers, I think that was it, that sold sole sponsorship of sort of a temporary NCAA Tournament Web site, and sold that sponsorship to a muffler chain.

A few more revenue sources... One is software development. Some newspapers that have sort of done a lot Web development on their own developed their own software, and I'm now seeing them sell that to other publishers and other businesses to help them get on-line. Kind of related to that, I'm also starting to see some of them set up their own separate consulting services.

Running seminars. Some publishers are starting to host seminars for local business on how to publish on-line or to create your own Web site, or even just offer classes to the public on how to use the Internet. So, some papers you'll just see them offer these classes for free because, obviously, you're training new customers and that's good for you; but it's also a potential revenue source as well.

Transaction fees for on-line sales. If you host an on-line mall or an on-line ticket service, then you'll want to be keeping at least a small transaction fee or small share of the services. As an example of that, Bill Gates keeps about 5% of their transactions that take place via the Microsoft network.

I was up with their cellular subscriber list — and obviously there's some privacy issues that you have to deal with — but I am seeing a few people that are having some success with that, like the idea that a local sporting goods advertiser might be interested in the list of people who visited your golf site, for example.

The last one is that a lot of these niche services also offer some advertising revenue opportunities. If you have like the *Arizona Republic* does, if you've got a lodging guide and a golf guide, you can sell sort of enhanced listings. So, for example, if you go over one of these golf guides, you'll see all 50 golf courses in Arizona, and a couple of them that will pay extra will get either a video clip or a photograph and a listing, that sort of thing.

The point of going through that list is just that in this business there still really is no killer app, and no one of these things as yet is going to support your service. I generally recommend that you try and choose as many of these revenue sources as you can. Obviously, for a lot of papers advertising is going to be the bulk of it, just as in the print edition.

Probably a good example of this is NandoNet, which is in North Carolina. NandoNet is the on-line newspaper new media division of [Mechlache] Newspapers, and this originated at the *Raleigh News and Observer*. What they do there, they're an ISP, and they sell access accounts to the five county areas surrounding Raleigh. They have an on-line newspaper service called *Nando Times* and they sell advertising links on that, and those rates range from about \$2,400 a week down to \$38 a week. So, it just depends on placement and how often your ad is going to run. They also have some niche Web services.

For example, they have something called the Sports Service, sort of a national sports service and they sell advertising on that. They have a premium service, so generally their site is free, but if you want to pay \$12 a year — a pretty modest cost — then you also get access to all of their wires and could do searches, that sort of thing.

Imagine Consulting Company has become an Internet publishing consulting company, primarily targeting the Latin America market where they think there is a lot of opportunity. A lot of publishers there are going straight to the Web. Oh, let's see, what else are they doing? Some of the other stuff I mentioned, the enhanced classified ads. They have something called the Nando Bookstore where they sell all their reprints; a lot of their reporters have written books, and that's a good way to market those. Then they're also part of a national personal ads network.

I had interviewed Nandonet's CEO, Frank Daniels III, a few weeks ago for one of my columns, and basically what he said of his strategy is, "We want to get bloodied in as many ways as we can, because we know we'll heal." I think that given the state of today's on-line environment, where advertising or subscriber fees or no other one source can probably yet sustain your on-line operation, this is probably the best approach. Smaller newspapers are obviously not going to be able to do this; they'll just have to pick and choose a little bit.

Okay, I just want to talk about advertising a little bit. At this point, for on-line publishers, I think the best prospects for advertising continue to be those companies that already have Web sites of their own. As most of you probably know, on-line is not yet an easy ad, so it only

makes sense to go to those companies that already understand the promise of on-line publisher. Today that's primarily going to be some of the national advertisers, though I'm starting to see a few more local advertisers beginning to create their own Web sites.

I was talking to the ad manager at the *Los Angeles Times* on-line operation recently, and she told me that they're starting to see quite a few more local business come up with their own Web sites, which then gives them a lot more sales opportunities when they launch their Web site early next year. But you get some of the bad news that I was sharing from Los Angeles from the *Times*, and that's that they have had quite a fair amount of churn with their on-line advertising. They have been able to fill a lot of their spots, but it doesn't stick around for quite as long as it would in the print edition.

Now, what about newspaper's existing print advertisers that aren't yet on-line? Well, I think without a doubt they're also really prime prospects for bringing on-line. Newspapers already have this really nice, solid relationship with a big base of advertisers. So, what I generally recommend is that they also maybe set up a division within the newspaper company to help them help the advertiser's create their own on-line sites.

What I've found from talking to various people in the industry is that they seem to have a little bit less success in just sort of selling an on-line ad in the same way that you would sell space in a newspaper. It's a little bit easier if you can help give the advertiser what they want and what you have, which is an on-line site of their own. I mentioned NandoNet as this one company that is already done that.

Another good example of this is a small weekly in southern Maine; this is a newspaper called the *Southern Maine Coastal Beacon*, it's a small weekly. It's one of the few companies that I can actually point to in the newspaper business that is making money on-line. This paper set up an Internet publishing division several months ago over the summer, and its already helped quite a few local businesses set up their own Web sites. It set up a bank Web site, a hotel, restaurant and I think an athletic shoe store chain. The *Beacon* does have sort of a traditional on-line newspaper service, and then that's what you see on the screen there, but that's not really much of a revenue generator for them. Most of their money comes from building Web sites for other folks, for their existing advertisers.

The newspaper's publisher, Jeff Baker, tells me that the revenues from his Internet publishing business, which consists of just a couple of people, already almost matches that from the newspaper; and he thinks that by the end of the year that he'll be making more money off of his Internet publishing division than he will from the newspaper itself. So, especially for a small publisher, I think this is a real interesting approach.

M: Wouldn't those local newspapers quickly saturate the area? Wouldn't that business be fairly finite for returns? Wouldn't they have to change the model?

Steve Outing: Yeah, the question was, wouldn't local newspaper just sort of saturate the market? I don't have a good answer to that one. That's probably true, but certainly that business is pretty competitive in that there are a lot of garage shops out there that are building Web sites. The one advantage that the newspapers have is just having that pre-established relationship with advertisers, and being able to just walk in there and say, "Oh, here's this other opportunity, have you considered that?"

I just want to make one last advertising point based on my research and talking to people. I think the idea of having a print sales person also sell sort of the on-line ads for the on-line service just doesn't seem to fly. I don't have a lot of examples of where that's worked. Actually, it's also been the experience that *Editor and Publisher* has reached on the site that I'm involved with. I think an advertising rep really needs to be focused on the on-line product if

they're going to succeed, and if the print product always comes first then your on-line product is probably in trouble.

Let's see, I just wanted to talk a little bit about competition, and I really want to point out that on-line is a very different environment for newspapers to be operating in. It's very different from what they're used to. Not only are they competing against other print publishers doing similar things, but they're also competing against broadcasters — you know, CNN, the local TV station, National Public Radio, that sort of thing. You're starting to see more competition from the on-line services. America Online just recently launched its first Digital City Service in Washington, D.C., and that's a direct competitor to the *Washington Post Digital Ink* service. And they'll be opening up some more of that instead of localized services around the country.

Now, some of the wire services like Reuters are setting up its own service. And then you're starting to see some of the sort of on-line "only news" services pop up like Rupert Murdoch's News Corp., Internet MCI's News Center Service, and then Global Network Navigator with its Web Review.

And then, of course, there's a lot of competition in the news business from entrepreneurs, companies like Individual, Inc. that are creating sort of news filtering services, some other companies like Farcast, ClariNet — you'll hear from Brad Templeton on ClariNet a little later this afternoon — and InfoSeek. I wanted to show you Yahoo's news page because now you can go search the Web on Yahoo, and one of the links is Headlines and you can get your national headlines from Yahoo now.

So I think the threat to newspapers, if they choose to go it alone, is particularly acute from broadcasters that CNN site on the screen a couple minutes ago. I think it's a particularly well-done site, but you see the CNN site is also very much like the *USA Today* Web site, but CNN just does a little bit of a better job using video and audio clips. So I wonder if, in that example, *USA Today* and CNN really should be operating a joint Web site instead of basically competing head-to-head.

Obviously, as a news publisher on the Web you're competing for people's time and Listservs, newsgroups, live chat, sending e-mail, just surfing the Web — you're competing against all of that stuff for people's time. It's a pretty tough environment to work in.

That kind of leads into my final point, which is that as a publisher you don't have to — and indeed you really shouldn't be — doing this alone. To succeed on-line I think you probably need to enter into a number of alliances, and a lot of newspapers have done that already. Allying with a local TV station is obviously a wise move. They might provide things like the radar television maps or aerial traffic reports, that sort of thing. You might ally with a local radio station, where you could maybe do a live chat version of a popular talk show, something like that. I am seeing a lot of newspapers ally with other organizations.

In yesterday's *Boston Globe* they're promoting their new boston.com service, and what this says is, "The *Boston Globe* is proud to join hands on the Internet with a list of four TV stations, three radio stations, and a whole bunch of other content providers."

So that's just the idea that they're not doing it alone. Actually, it's the first one I've seen where a newspaper has allied with multiple TV stations. That's kind of interesting. More common is like the service in Iowa called FYIowa, and I think it's the *Cedar Rapids Gazette* that is allied with one of the local TV stations and with another publication called *Iowa Farmer* and somebody else I can't remember right now. So anyway, the idea is just don't do it by yourself.

Before closing I'll also just mention two of the most significant feature alliances for newspapers. The first you may have heard about; it got a fair amount of publicity — although right now there's not much to show for it — and that is News Century Network. That's an alliance of nine of the largest U.S. newspaper chains, including the biggies: *New York Times*,

Times Mirror, Knight-Ridder, Gannett. It's establishing an alliance of on-line newspaper services and sort of creating a way to tie together many local services and share content.

The idea with NCN is to create a value to the newspaper members by creating a national content for all of its members. For example, what NCN might do is set up, say, a national skiing service that all of those newspapers would be able to include as part of their content. And apparently they'll also be providing some sort of a basic Associated Press facility in HTML format that would be used by all of the NCN members.

At-Home, which I mentioned earlier, is the cable effort to bring a super-fast Internet access into the home. Now, At-Home is supposed to go commercial in 1996, and it's likely to offer Internet access accounts for about \$30 a month for unlimited hours. Part of that the plan currently is that you would get the cable modem — I think they currently are about \$500 — and you would get that as part of your monthly payments.

[Tape change]

Steve Outing: ... set-top box if you subscribe to cable today. Now, what the At-Home model does is form alliances with the local cable companies, and then At-Home will be developing the national content and the local cable companies will be responsible for local content. Now, I've been to a couple conferences recently where I heard some cable executives speak, and they're generally pretty adamant about, "Well you know, we don't want to get into the content business." So obviously there there's some good opportunities for newspaper publishers to partner with them.

M: Do you have NCN or At-Home on the Web?

Steve Outing: At-Home is on the Web and NCN is not yet. The last I heard they're still searching for their CEO, so that's a little nebulous right now, but they do have a lot of working committees. People at all the various newspapers are working on this, so there's some alliance possibilities with At-Home, but it also — I wish when I was talking about newspapers as ISPs earlier [I had mentioned that] things like At-Home really represented a pretty serious competitive threat to newspapers going into the ISP business as well.

Okay, so let me just summarize quickly. Just to quickly summarize what I've talked about, I think my advice that I generally give to newspaper publishers is to at least for now really try and mine multiple revenue sources. You can't rely solely on advertising.

Collect ISP revenues while you can, because that's potentially sort of a short-term opportunity. Persevere through hard times. You know, I think we're going to see some cutbacks in the next year, but I continue to remain pretty optimistic that publishers will be able to start making some money off of this, and some of them hopefully in 1996. Hopefully, we're starting to get out of the experimental stage.

Target advertisers who are already on-line; you aren't likely to get newcomers on-line unless you have the department set up to create Web sites for local businesses. Sort of the idea of don't necessarily just sell ads on-line, but also sell Web site construction services to advertisers.

Have a separate advertising staff to sell your on-line product if you can possibly do that. It's got to be somebody's top priority, and not the second string.

One of the more important points is just make appropriate strategic alliances. In this business, joining forces with your enemies generally can make a lot more sense than to try to fight it out with them.

Take part in important joint ventures that come along, like News Century Network and At-Home. And I'm sure there will be other things coming along that will be significant to the publishing business.

Remember that your print competition is not just other print publishers. The Web is king today, but what will it be in two years? Certainly I still think the Web will be around, of course, but I don't have a good idea what that's going to look like. So my point is just that publishers really have to stay on top of the technology. Anybody who is doing this sort of service should be experimenting with *Java* and doing all that stuff.

Okay, so I just wanted to leave you with a couple of URLs for some resources that I think you might be interested in if you're involved in this business or interested in it. One is the *Editor and Publisher* interactive Web site that I'm involved with. You will find a lot of interactive news there and you'll find a five-day a week column that I write called "Stop the Presses" and there is the URL. I'd love it if you would read that. That's available only on the Web, by the way, and not anywhere else. One of the things that I do for E&P is that I maintain something called the "On-line Newspaper Services Resource Directory," and there you'll find information of currently about 540 papers and what they're doing on-line. That includes contact information and description of the services, that sort of thing.

So, I think that's about it. So, if there are any questions that I can answer?

M: What is your personal opinion about viability of NCN?

Steve Outing: The question was, what's my personal opinion about of NCN? Well, it sounds like a wonderful idea in concept, but I think it's going to be very difficult to pull off. You've got nine companies involved, and at this point I don't know that there's sort of one real leader in that. I think the idea of all nine of them being able to cooperate is going to be a really tough nut to crack. I hope they can do it, but I don't know. Way in the back there.

M: [inaudible]

Steve Outing: Well, I think generally I don't believe that just re-purposing content is — that obviously can't be enough. I mean, certainly that's important. I've been kind of interested in talking to some on-line newspaper practitioners and in finding out what their most popular features are. I have been on-line for a while and so I've always expected that it would be the interactivity that is the big draw; but what I find from talking to a lot of people is that their most used feature is simply reading news on a computer screen. I have a hard time understanding why that's so compelling. I think that is really important, but I just think that you really have to have a balance, and the interactivity is just so important in creating a service like this. You have to create it so that it fits the medium.

M: How are newspapers differentiating themselves, aside from geographically, from sort of focusing on Raleigh or D.C.? What sort of examples of real creativity have you seen out there?

Steve Outing: Well, I mentioned the niche services. I'm seeing a lot of those, and a good example of that might be the *Cleveland Plain Dealer*. They've recently launched a site called rockhall.com and that's a partnership between the newspaper and the Rock-and-Roll Hall of Fame. There are a lot of services like that. Some of them will partner up, say with a local museum, and create — there's a site called The Yuckiest Site On The Internet which was launched a month or so ago, and that's a partnership between Newhouse Newspapers and I think the Liberties Science Museum in New Jersey. They've created a kid's site. I don't think

that's the advertiser-supported right now, but they might be able to support that sort of thing by grant money, development money, or through simply finding corporate sponsors. So yeah, I am seeing a lot of creativity in the business.

M: What do you think about personalization [inaudible]

Steve Outing: The question was about personalization, and what I think of how that's shaping up. The newspapers themselves have been a little bit slow to take that technology and implement it on their on-line services. It seems like more of the activity in that area has been going on by entrepreneurial companies like Individual. Microsoft Network apparently has an alliance with Individual, and Microsoft Network also has its own forty person news room. So that presents a pretty serious competitor to newspapers. What I think we'll all probably see is more papers starting to get involved with that. I think that's certainly one of the most compelling services that a newspaper can provide on-line. Back there.

M: How would you suggest collecting their fees, by doing it on-line [inaudible] transaction server?

Steve Outing: The question was about how newspapers are collecting their fees. As when I went through that list of different revenue sources, people are trying lots of different things. I did mention that the *San Jose Mercury News* was collecting a monthly fee, but that's actually the minority. Most of them are still offering everything for free and supporting it by advertising and other revenue sources, and I'm not seeing one particular revenue model that's dominant yet. Everybody wants to collect some fees from on-line transactions, but I can't point to very many people, at least on the Web, who are doing that. Now, on some of the proprietary on-line services, like some of the ones on Prodigy, their on-line commerce is a little bit more established and some publishers are making money that way.

M: [inaudible]

Steve Outing: Pardon?

M: [inaudible]

Steve Outing: Oh, we should have talked about Lexis-Nexis being fee-based. Back there.

M: [inaudible]

Steve Outing: The question was, is there a difference between business models between newspapers and magazines? Well, certainly that's true, but as I mentioned quite a few newspapers are developing these little niche services that will serve a national audience. For example, the *Boston Globe's* Web service that I just mentioned was just launched publicly. They had a skiing service there, so that's going to be of interest not just to Boston locally, of course, but the entire New England region. If one of the Denver papers, where I happen to live, put out a skiing service that would probably be a national service.

M: How would they adjust their business model to be responsive to the Denver newspaper, now that they're creating this? What new alliances would they have to build?

Steve Outing: Well, let's see if I can figure out how to answer your question. An example might be NandoNet, which I was talking about earlier. Now, they started out with a local model selling Internet services, selling ISP accounts locally, but they evolved their sort of on-line Web newspaper to be of national interest. Nando doesn't sound like a local product necessarily. They created something called the Sports Server which is really a competitor to ESPNET and those sort of services. Yeah?

M: [inaudible]

Steve Outing: Right. Yeah, that's an interesting point, too. I didn't really touch on the expatriate market. Quite a few newspapers, including some outside of the U.S. I could think of — there's a Web site in Glasgow, Scotland, and it's one of the tabloids; and they set up their Web site and if you go there you can go to a "Letters to the Editor" page, and the last time I visited all of the letters to the editor were from outside of the country. So that's a good potential market.

Let's see. How are we doing for time here? Three minutes left. So, are there any more questions or we can all take a break? Oh, one more.

M: All these things are current information directories and so forth. Is anybody mining their back files?

Steve Outing: Mining their files, their archives?

Yes, quite a few. The *San Jose Mercury News*, for example, has had its on-line archive on America Online since the beginning and they charge — I don't remember exactly, something like 15 cents a minute during off hours and 80 cents a minute during peak times. One of the comments that I heard from them which was interesting is that when they opened up their archives on America Online, they worried about, "Well what's going to happen to our revenues from the premium database services like Lexis-Nexis, the Data Times?" And they discovered it really didn't have any impact, it was just an additional revenue stream for them. I don't know if that will continue to hold long term, but initially it was a new market for them to market their archives.

Okay, well it looks like we're about out of time, so thank you very much.

PUBLISHING ON THE INTERNET THE CULTURAL, LEGAL, AND SOCIAL ASPECTS OF CYBERSPACE



SPEAKER

Vic Sussman

Senior Editor/Cyberspace, *U.S. News & World Report*

Vic Sussman: Thank you. I did not name this session, by the way. Neither did Walter, but when people from Mecklermedia asked me, they said, “What do you do?” And I said, “Well, I write about the legal, social and cultural aspects of cyberspace,” and that’s what they called it. I mean, if I had said, “I don’t know,” that’s probably what they would have called it too. My title, actually, at the magazine is Senior Editor/Cyberspace. That was given to me by one of our PR people, and I decided that they would have to pry it from my cold, dead fingers to make me give it up because it makes me feel like a character out of a Raymond Chandler novel.

You know, I cover cyberspace. Although I know a lot of people hate the term “cyberspace,” it beats “information highway.” I’d like to spend about the next thirty minutes doing an extended rant, and at the end of it I will say, “end of rant.” I should tell you that my comments do not represent the opinions of my employer, *U.S. News and World Report*, and they would probably tell you “and not anyone else in their right mind, either.” But as somebody who covers this and basically created the cyberspace beat at *U.S. News* by rattling cages for several years and saying, “You know, something is happening here and you don’t know what it is,” I’d like to talk a little bit about the way I see things, and particularly the way I see things in the media — and try to do this without picking on my colleagues too much. But many of them deserve it.

So I usually call my talk “Fear And Loathing In Cyberspace,” because actually I think that’s the phase we’re in now. We are in the fear and loathing stage, and that seems to happen if you read your [inaudible]; it’s essentially what happens whenever there’s a new technology that comes along, especially a new communications technology — society tends to go through periods where there’s great fear and loathing.

You’ve probably heard the story that when the automobile was first developed there were municipal laws that mandated that someone had to ride in front of the approaching automobile on horseback, ringing a bell and warning people that the car was coming. There were also other people who made predictions that no automobile would exceed 25 miles an hour because humans wouldn’t be able to breathe at that speed.

I remember talking with Dave Farber at the University of Pennsylvania, who was involved in modem development, and Dave said there was a time when they hit three hundred what they called “baud” at that time, and they felt that they had really pushed the envelope as far as it would go.

So this is really a historical period, but I think that the period we’re in now with regard to the network world — we have an advantage over people in the past, and I think that is because of the development in technology in the last fifty years. I think we have much more perspective than the people who feared the automobile. In fact, I have a button that I picked up in a shop — and I can’t tell you exactly what it says or they’ll turn this place into a supermarket — but essentially it says, “This is the ‘90s. Where’s my air car and robot?” I left one word out — it’s a little more explicit as a button — but if you remember, the ‘90s were supposed to have skyways and airways and you know, you can’t even get across town, especially in this town, because they keep tearing up the roads.

But I think with this technology, in fact, we should be much more settled about this and we should be able to look with much more perspective and see what’s coming. Now no one

knows what's coming and I like to say to people, "If three or let's say four years ago you had said you envisioned a company producing browsers," what would the reaction of people have been?

Or if you had said in 1980, "The concept of the WorldWide Web is the embodiment of human knowledge," as Tim Berners-Lee grandly and probably accurately calls it.

Or even if a couple a years ago you said, "I have an idea for having audio and real-time [video] come over your computer." I mean, all of these things have come fairly rapidly, and I like to tell people that covering cyberspace is like being a reporter who covers the Justice Department, and every morning I have to go to the Justice Department to a 10:00 briefing — and every morning when I get there they've moved the building and they haven't told me where they've put it. Covering cyberspace is a lot like that.

My plan, ultimately, is to have cosmetic surgery — I'm going to have my appendix taken out and my modem put in so I can be like [inaudible], I can jack in from anywhere. The only problem is I don't know where they would put the mouse.

So, to tell you how I got started in this... I am not a techie, I don't come from a technical background. Basically I'm a kid whose entire life was changed when my dad and I built a crystal radio. And I can remember my father and I sitting at the kitchen table and winding the wire around an oatmeal box, a Quaker Oaks box with the germanium diode and the cat's whiskers and one earphone, and I remember vividly being about 8 or 9 years old and I put the earphone on and my father said, "Now watch what happens," and he touched the bare wire, or I think I did as a child.

He had scraped some paint off the radiator — I'm dating myself, but nobody else would — and I remember touching the bare wire to the radiator and hearing static crackle in my ear and then music which was coming from a foreign country. We were living in New York and the music was coming from New Jersey. And I remember just being absolutely knocked out. It was like magic.

Walter was teasing me, because he knows my hobby is actually magic — which has figured into this too. Arthur Clarke has said, "When a technology advances sufficiently it appears to be magic," and for me as a little kid this was magic. And I knew at that time that I wanted to do something that had to do with this technology.

Now, what's interesting is that last year in Boston I met Len Kleinrock, who is one of the pioneers of ARPANET and Len and I were talking and I asked, "How did you become a scientist?" He built a crystal radio as a little kid on the east side of New York, and I said, "Isn't it interesting that my experience with a crystal radio pushed me into broadcasting, yours pushed you into actually the science of the physics behind broadcasting and the physics behind computers?"

But at that age I knew that's what I wanted to do, and so when computers came along I didn't get involved. You would think that I would probably want to jump right in, but at that point I was going though my [inaudible] and I decided that I wanted to live in the woods and grow my own vegetables, and computers at that point were just — I mean the idea of computers just disgusted me. Everything that was wrong with society was being embodied in computers.

Now, I was a freelance writer at the time, living in northern Vermont. I owned a 23-acre farm, and I belonged to a writers' group and we used to have monthly meetings of the few writers that lived in this part of the world. I remember the monthly meeting that I went to in 1982 was at the beginning of what turned out to be a blizzard, and I went to a friend's home and I remember driving through the increasing snowfall, walking into his 100 year-old Vermont farmhouse — and he and his wife had just purchased an IBM personal computer for \$5,000.

It was, you're laughing... It was 128K or something like that, and I think my watch actually has more than that. But I remember walking in, the smell of wood smoke permeating his home, walking into this room and here is this computer which I had already made up my mind I was going to hate — until I saw him demonstrate what he called "word processing." And I remember turning to a friend of mine and rather grandiosely saying, "I have seen the future, and it's digital." And I knew right then that I had to have a computer, because it meant no more note cards. Well, at least I thought that at the time.

There's something to be said for analog, as I found out later. But I knew at that point, when I saw that cursor go across and I thought, "you know, I've been buying White-Out by the spray can and this is amazing to me."

So I remember going into St. Johnsbury, Vermont, and they had one computer store and they sold Osbornes. Remember the Osborne? Four inch screen — actually three and three quarter inches, measured diagonally — it was amber, weighed 25 pounds and looked like a Singer Sewing Machine. It was my first laptop and I remember going in the store and saying to the salesman, "Why should I buy one now when they're obviously going to get better and cheaper?" And he said, "Because if you wait five years you're going to go five more years without a computer." So for \$2,000 I walked out with an Osborne that had 64K and I thought I owned the world at that point. I literally lugged that machine everywhere. It changed my life as a writer, and it was the end of my [inaudible] phase.

So I feel very comfortable talking about what's being called the "new [inaudible] Kirkpatrick Sale" you've probably heard about. Ah, Kirkpatrick Sale smashes computers on stages to demonstrate his loathing for technology and then goes back to his air-conditioned apartment. I imagine he probably takes computer-controlled airplanes to get from place to place, unless he's walking.

I've already been through this phase; I've spent 16 years growing my own food and I delivered my daughter at home, so don't tell me about do-it-yourself, I've been there. And I am absolutely in love with this technology. Yet the first demonstration that I had of going on-line, I had the initial reaction which was, "I'm never going to do this." Why? Because I interviewed, for a column I was writing for the *Washington Post*, a woman who had become psychologically — I couldn't say physically, but psychologically — addicted to live chat lines. Now, fortunately her husband was a doctor so they could afford the \$300 phone bills that she was running up every month. But it really soured me. I liked her and we're still friends, she's now a sysop for CompuServe, so that's how you turn your addiction into something positive. And she actually became a travel agent because she became so experienced with computers that she went on from there.

But it really soured me, and the reason was I thought, "I don't like to hang around bars, why do I want to go out in what we call cyberspace and talk to strangers?" It seemed stupid to me. So the turning point came when a very close friend of mine, who happens to be a professional magician — so we're back to that again — is leaving Washington, moving to New York and says, "Let's keep in touch though e-mail," and I said, "Jamie, I don't do e-mail; I do e-mail at the office and it's very impersonal, I don't really want to do it."

Now, my friend Jamie Swiss — who's one of the country's best close-up magicians — looks me in the eye and he says to me, "You know, there's a whole universe out there and you don't know what it is." Well, I thought, that's a personal challenge and I can't run away from that, so I got a CompuServe account.

It took me roughly twelve hours and it was like St. Paul on the way to Damascus being struck by lightning. Did you ever notice that people who discover the on-line world are like reformed drunks? You know, they have to convince everybody. Or it's like when I first became a vegetarian 26 years ago; you stop people in cafeteria lines and say, "Do you know what that

is?” You know, it’s a horrible phase that you go through and this is what happened to me. I came into *U.S. News* and I said, “You know, this is amazing.”

Well I apparently was the only one who thought so, but from there I went on and got accounts on America Online and Prodigy and The WELL and just all over the place, and that’s when the jokes started about the fact that my wife started referring to herself as an Internet widow and this sort of thing; going through the whole thing. But at that point I really became convinced that my friend Jamie was right, there was a universe and I didn’t know what it was and most people didn’t know what it was, but it was not going to go away.

My favorite comment is when people say, “Well you know, this is like CB radio, it’s going to go away.” Well then, if it’s CB radio I could probably use my old handle, the Big Soybean. That’s what I used to use. Mr. Natural was taken — I tried to get that on America Online.

So that’s how I became involved, and I would say — as corny as this sounds, this many years later this really is corny — but every time I log on and there’s mail from wherever I get the same kick that I got when I first logged on. It’s still amazes me and I hope it will always continue to amaze me. It is magic, it is absolutely staggering to me.

[Robert Sideman] — I’ll embarrass [Robert Sideman], the editor, publisher, and owner of *Sideman’s Online Insider*, he’s a friend of mine and he’s in the audience — and we were talking about this before, and I now divide people into categories. Robert and I got to know each other through e-mail and then finally met face to face. That’s one category of friendship. I have other people I met face to face but we never got to see each other again, so we became friends through e-mail. And then there are people I’m probably never going to meet who are in different parts of the world that I would consider actual friends because we share large amounts of information.

So I’ll talk about that in a minute too, the idea that this fear and loathing is going to isolate us — and of course most of us, I think, have found that it’s exactly the opposite. Now, having said that I’m absolutely in love with this technology and that the feeling doesn’t really go away, let me talk about my anger about some of this. And, Walter, I forgot to set my timer, so give me a heads-up, because once I push my own hot buttons, you’ve got to watch out.

I think the media has mishandled this story very, very badly for the most part. Let me give you some examples. This is my favorite example; this is probably three months ago, maybe four months ago at the height of the hysteria over cyberporn. You probably all saw my competitors’ cover story, “Cyberporn.” I like to introduce myself as someone who works for the weekly news magazine that does not have to issue apologies for the cover stories that we write. I’ll come back to that.

If Philip Elmer Dewitt is here — hi, Phil. About four months ago or whenever it was, Ted Koppel did a show about “what’s not being called cyberporn,” and his show was basically what can we do about it. You know, we know it exists — what can we do about it? His guests were Mike Godwin from the Electronic Frontier Foundation and Ralph Reed from the Christian Coalition.

Now, normally you’re writing your own jokes out there, and normally I don’t like to watch shows like this because they’re not good for my blood pressure, but it’s Ted Koppel, the dean of American television journalism — which actually is an oxymoron — and so I’m watching this show and Ralph Reed tells a story, and this is the way the story goes, this is pretty much verbatim. He said — “we” meaning his organization — “We know of a woman who wanted her child to learn the Internet” — now right there my syntax meter, my spider sense is tingling — “who wanted her child to learn Internet so she went out and she bought the software, and she came home” — now these are Ralph’s words — “she came home, she

popped the software into the computer and then she left the room for five minutes and when she came back her eight-year-old child had downloaded scenes of bestiality.”

Well, my initial reaction was that this is a child with a very bright future in computers. I also wanted to know where she bought the software, because with the SLIP and PPP and a 56K line... And what amazed me is that Koppel never stopped him and said, “Ralph, are you out of your mind?” I mean, that’s what I would say if I was sitting on the show: “Ralph, have you had your medication adjusted? What kind of story is this?”

And of course Godwin, who could have eaten him alive, really wasn’t given a chance to respond to this. So when I came down off the ceiling I continued to watch the show, and this was my favorite part: Ted Koppel says — see, Ralph Reed makes the point that there have to be tight government controls over content because the American public cannot be trusted to police itself or it’s own family — and Koppel says “Well, you know, I have to agree with that,” and Godwin says, “Now wait a minute, we’re intelligent people, people should be able to run their own families the way they want to,” and Koppel says, “No, no, I’m the best example you could have. I don’t know anything about computers. My kids know more about computers than I do, I am a big dummy about computers,” at which point I have to be restrained because I’m almost frothing at the mouth.

This is what occurs to me and this is what I want you to imagine, and this is where we are with the media and this new technology. I want you to imagine Ted Koppel or David Brinkley — who is another one, by the way, who has said publicly that he does not like computers and that he uses them only to process words — I want you to imagine someone like Ted Koppel — now I’ve killed my chances for being on the show, you realize that — I want you to imagine him saying some night as the program *Nightline* opens that he looks directly into the camera, into the hearts and souls of the American people and he says, “Ladies and gentleman, I don’t know anything about the health care problems in this country, I haven’t got a clue about it, my kids know more about health care than I do, in fact I think it’s really funny that I’m so stupid about this. And tonight’s show is about health care and I’m going to be asking the questions.”

So it has become fashionable; I think that’s probably what it is. We all hated the guys in high school who were on the AV squad, right? The guys with the retractable key chains. I played chess with them, so I never had that problem. I thought they were cool. What do you think Bill Gates is? I mean, that’s the revenge of the nerds, right? But it has somehow become fashionable now to be stupid about technology. Maybe we need a sociologist in the room so I can lie down for fifty minutes and talk about this, but it seems to me that this goes back to our mythical pioneer roots, the rugged American, the “we don’t need this effete technology, all I need is my ax and I can go out into the wilderness.” American men still believe that, they still believe that if they were dropped by helicopter into the Mojave Desert they could get out, maybe with an American Express card but not with a Boy Scout knife.

We do have a kind of schizophrenic attitude in America about loving technology and hating it at the same time, and this may be part of that. This is probably an article I should write at some point, why it is so fashionable for people to say, “I don’t know anything about computers.” I’m told it’s a generational thing. I’m told by younger people who have grown up with computers, like my kids — by the way, you know the reason I decided to get a Macintosh was I was tired of talking CP/M to my son, it didn’t seem like a good way to have a father-son relationship, saying “control D” and then, you know — but it seems to me that there is a generational thing and I hear this all the time, that if you’re over 40 you don’t know how to use a computer and you’ll never learn. Well, I’m over 40 and that’s just ridiculous to me.

Now the other time that this same thing happened was even more shocking than Ted Koppel, and I am picking on Ted Koppel because he should know better. When I was at a

House science subcommittee hearing, also on cyberporn, and I heard congressman after congressman — and they were congressmen, not congresswomen, and by the way, the Chair of that subcommittee is Connie Morella, who happens to be my congresswoman, Connie did not say this — but the men, all of them said “I’m over 40 and I don’t know this stuff.

And one congressman said, “I went out and bought a book called *Computers for Dummies*” and a congressman at the other end said, “No, no you should have bought the other book, it’s called *Computers for Congressman*.” So it’s a great line, you know, until you stop and think that the next thing the congressman said is, “I have to vote on a bill about this.”

So, in other words, now I’m thinking, “Gee I wonder if he knows nothing about agriculture, if he knows nothing about defense. This must be democracy in action” is all I can think of. But to sit up there and say “I don’t know anything about this and I can’t learn to do it.” He can navigate a 3,000 pound automobile through traffic but he’s afraid if he pushed the wrong key it will blow up in his face? I mean, this is why children are so wonderful, they don’t worry about breaking things.

You know, that’s why kids can sit down at a keyboard and get peanut butter between the keys and everything — they didn’t buy it, they don’t have to pay for it, it’s not going to blow up, they don’t care and they have a wonderful time. So maybe we have to be more childlike about this. But this is what’s happening, is that we have people [like this] on Capitol Hill.

Now I’ll talk about the Exon Amendment; that was a wonderful period in our history which is of course still affecting us. Senator Exon from Nebraska, who is not running for re-election, whose... I always think it’s sort of like if Senator Exon took a plane directly from Lincoln, Nebraska to Times Square and landed by helicopter right in Times Square, got out of the helicopter, walked directly into a porno shop, was properly shocked at what he saw, got back on the helicopter, flew back to Nebraska and said, “I’ve been to New York and it is a cesspool.” He didn’t go to the museums, he didn’t go to the libraries, he just went one place and was properly shocked.

Essentially that is what’s happened, because I called the Senator’s staff and I said, “Would you please tell me what the Senator’s experience is with the on-line world?” The answer was quite honest: “None, except that someone sat him down and said isn’t this awful.” So I said, “Uh, that means I can go into print in the magazine and say, Senator Exon’s only experience on the Internet is looking for pornography.” Which is essentially true.

Now we have also heard that Senator Exon has the book he calls the “blue binder,” which is filled, apparently, with photographs of child pornography and photographs of bestiality. I find this, as a reporter, I find this probably one of the biggest stories of the year, because as you probably know, mere possession of child pornography is a federal offense. Why have they not arrested this man? Not only does he possess this material, he is walking around Capital Hill showing it to other people. So what we have is a kind of hysteria.

The other hysteria has to do with, of course, terrorism. I went to a Senate hearing this time, the Senate subcommittee on terrorism, and Senator Diane Feinstein went off because she was concerned that there was bomb-making information on the Internet. One of the panelists, one of the witnesses pointed out, held up a book — I’m trying to remember the name of it, something like the, well not the *Bomb Maker’s Manual*, but something like that.

M: *Poor Man’s James Bond*?

Vic Sussman: No it was not the *Poor Man’s James Bond*.

M: [inaudible]

Vic Sussman: No it was not the *Anarchist Cookbook*. This is a very well-read audience. It was something like the *Dynamiter's Handbook*, and he pointed out that it was published by the United States Forest Service and it told how to make bombs using fertilizer, and this was after Oklahoma City. And Senator Feinstein said she was shocked that this information was being disseminated by the government and was on the Internet, and she wanted to have a law against it.

Then Jerry Berman from the Center for Democracy and Technology said, "You know, we have a First Amendment that says you don't really regulate content," and she said, "Well I think that's wrong."

You know, this is what happened. And then Arlen Specter held up the *Big Book of Mischief*, remember that one? Remember that one? *Big Book of Mischief*, a mayhem manual, had been pulled off the Internet.

Of course, immediately afterwards I went and got the URL so I could download that and take a look at it, and Jack Rickard, the editor of *Boardwatch*, and I shared some mail about this. The consensus is that the material that's in a lot of these books really should be disseminated, because we will then be able to identify the potential terrorists. They will be the guys who have fingers missing, because most of the material in this is pretty unprofessional.

I have friends in law enforcement and I have discussed this with them for stories I've written, and they have told me to a man that the really bad guys do not use the Internet to get information about how to kill people, they have basically learned it in prison and if they need to get a gun they do not get an AOL account.

But again, what you have is new technology, so it's very frightening to think of eight year-old junior sitting down and downloading bomb-making information, and he doesn't know what to do this afternoon, whether he should look at his bestiality collection or whether he should blow up the neighborhood. It's a tough choice for a little kid.

There was a case about two years ago, the Michael Alansky case in Hartford, Connecticut. Michael Alansky was 18 years old, and he was arrested for running a bulletin board system and disseminating bomb-making information, among other things, to minors. He was arrested, he was put in jail, and when he came up before the Judge for bond — this was after the World Trade Center bombing, bad timing on Michael's part — and Michael had not blown anything up.

I do not know Michael, by the way, even though I'm calling him by a first name. He had simply had a bulletin board, and he did not write the information, he was disseminating. It had been written by a 16 year-old who had culled it, he later said in an affidavit, from college chemistry books. So he said, "I don't even know if this stuff works, really." And so these are bad boys putting stuff up on BBSs and downloading it. Michael comes before the Judge, the Judge levies a bond of \$500,000 and says, "I consider you just as dangerous as the people who bombed the World Trade Center." The kid goes to jail for one year, his parents cannot get him out.

Now, I wrote about this, and Mike talked about this — the EFF was trying to represent the Alansky case — the kid basically languished in jail. I talked to Jack Rickard about it and Jack said, "Well, one of the problems is Michael Alansky is no angel, he does have a juvenile record. He has been involved in explosives apparently, pipe bombs, never hurt anybody, no history of violence, never really blew up anything."

Well, I have to admit as a Senior Editor at a major news magazine that I have blown things up in my time too. How many guys in this room at the age of 15 or so had a fascination with, not bombs, but had a fascination with things that go boom? Okay. How many women in

the room at the age of 15 had a fascination with things that blow up? It's a guy thing. In Michael Alansky's case a year in prison, in jail, without a trial...

During that time he was physically assaulted and he also witnessed another prisoner commit suicide. His parents could not get him out. At the end of a year he copped a plea, essentially confessing to a probation violation for an earlier juvenile offense, and he got out. He lost all of his computer equipment and he lost a year of his life. And what did he do? He provided information that is available a couple of miles from his house. You mentioned the *Anarchist Cookbook*. That book is for sale in Hartford, Connecticut, at a book store not far from Alansky's house. So what you have — and I'm not making a plea for bomb makers of the world — all I'm saying is that if you're going to have a First Amendment and you're going to disseminate this information in a bookstore, why is it wrong when you're disseminating on the Internet?

Well, the theory is, as I understand it from senators and congressmen, is that it's easier for people to get out. I'll wait while you laugh; because those of you who have been using the Net for a while, if you think it's easier to FTP than it is to go to the bookstore or go out to your newsstand and buy a copy of *Solider of Fortune* and just go through the ads in the back or get a copy of *Popular Mechanics* and get the ads that say pyrotechnics in the back, and get the catalogs...

I mean, this is really nutty to me. It is absolutely nutty to me. And what's really nutty is that at 18, at 16, at 15 any kid can walk into a bookstore and buy a copy of *Solider of Fortune*. There's no law against buying *Guns and Ammo* or buying any magazine that purveys implements of violence. We don't have a law against that because we have a First Amendment.

The example I always use is Howard Stern, another bomb maker; his show is, anyway. Howard Stern can write anything he wants in his book and he is covered by the First Amendment, but if he reads it on the radio he gets fined, and that is the strange attitude that we have in this country about the Bill of Rights, certainly about the First Amendment. That we have this strange attitude about content regulation. So this is really where we are.

And now we're seeing the other scary thing besides the bomb makers and the pornographers are the hackers and the crackers — and of course most people in the media don't know the difference historically between a hacker and a cracker, so they're all hackers in their view.

I wrote an article about a month ago about how computers are portrayed in the movies. Last summer we had the movie *The Net*, we had *Virtuosity*, we had *Johnny Mnemonic*, which disappeared like a stone. I never got to see it, it disappeared so fast. It was a great idea, it was from the Gibson novel, what a great idea. The guy uses his head as a store — he couldn't afford a zip drive, you know, so he has to use his head — and somebody is going to cut his head off, they've never heard of encryption. I don't understand it but I wanted to see the movie.

And then the other movie was *Hackers*, which glorified it, which I said in my article. It was about young people who made the world safe for people who wear their baseball caps on backwards. But in every one of these movies the computer is essentially evil.

You can really divide the way we approach computers in popular [culture] into about three categories. We have movies in which the computer is simply evil and we have movies in which the computer is a good computer but becomes evil. I mean, one example would be probably *HAL 9000*, which is a classic example; although really if you read the short story it was taken from [you'd see] HAL had a conflict, he wasn't suppose to tell them what the mission was. But he also wasn't suppose to hurt them; it was Asimov's law and he just got so conflicted that he went nuts. So you give HAL a little benefit of the doubt.

But then you have a movie like the *Demon Seed* in which Protius 4 — I know how you guys spend your time, my God — Protius 4 figures out that they're going to pull his plug because he's too smart, so he impregnates Julie Christie. I'm using "impregnate" so I don't have to say "rape," but that's what it was in the film. Not explicit, but still awful. Yes, they have a baby, and I don't want to spoil the ending for you, but you can't really run out and see the *Demon Seed*.

In all these films the computer... Now there are also films in which the computer is neutral but the people are bad and they use the computer for evil purposes. And then there are movies like *Sneakers*, in which the computer is kind of neutral and the guys are both good and bad at the same time.

But nobody shows movies in which the computer plays a roll that it plays in my life, and I suspect in most of your lives. I talked to Roger Ebert about this and Roger e-mailed me and he said, "Well, you know, it really wouldn't make an interesting movie to have a movie about an airlines reservation clerk whose life is enhanced by a computer, because the nature of dramatic conflict is such that you have to have a bad guy and it's easier to show the computer as an object of evil than it is to show it as something that is positive."

The problem is that all of these movies... And Hollywood is finding out; none of these movies were terribly successful. And by the way I saw all of them except for *Johnny Mnemonic*, and even the people who loved *Johnny Mnemonic*, even Mike Godwin, whose name on *The WELL* is "Mnemonic," didn't like *Johnny Mnemonic*. But I still want to see it.

But in all of these movies, they didn't do well financially at the box office, and the reason is because no matter what you do in Hollywood you still wind up with people typing. And people typing is not really interesting, so you have to glitz it up and the filmmakers do wonderful things. I think in *Hackers* you see that they are looking at the screen and typing and on their faces are the letters reversed from the glow of the computer screen, isn't that correct? And in *Sneakers*, every time they hit a key the letters tick on the screen, they make a little ticking noise, so they have to do this to kind of jazz it up.

Now, the next movie I'm waiting for is the *Kevin Mitnick Story*, and actually John Markoff, as you know, has written a book about the capture of Kevin Mitnick, arch fiend that he is. Anybody know where Kevin Mitnick is? He could be here by the way, if he's out, but how are they going to make a movie about Kevin Mitnick, the Uber Hacker?

You know, as one cop told me, the "Hannibal Lecter of hacking?" How are they going to make a movie about this overgrown kid who steals 20,000 credit accounts from NETCOM, then put it on a publicly accessible machine? That was written about in *2600 Magazine*, but that's another story; I don't want to embarrass Mr. [Garison], if he's here.

So Mitnick steals these things but he doesn't make any money. How are we going to make a movie? You have to make Kevin Mitnick really bad, you have to make him like Hannibal Lecter, but that's not really true. No, so you have to make Kevin Mitnick heroic — but we really can't do that, they can't make the movie. I just don't think Markoff can sell this, even though Miramax has an option on this script by the way, or on the story. I don't see how they can make that movie.

Because Hollywood — and I'm using Hollywood generically — they have to cast computers in a bad light. The only thing that I would say, and people always say this to me, is *Star Trek*, but my article was about movies. In *Star Trek*, certainly the computers are constructive in that sense. So, I think this is where we are, in this fear and loathing sense.

And now we're moving into another phase and that is the "Cliff Stoll" phase. Cliff wrote a book called *Silicon Snake Oil* for which he is now touring the country, making speeches, telling us that he has misspent his youth, essentially, and that computers are a very bad thing because

as he says in the book, "if you are on-line it's not the real world, and you should be out growing tomatoes."

Well, I don't know about you but I had tomato plants this year and I was on-line. I guess I'm just a polymorph. A friend of mine, [Glee Willis], e-mailed me some time back and Glee is an engineering librarian at the University of Reno and Glee said, "You know, I wonder if Cliff Stoll would have felt that computers were a terrible waste of time back when he caught the hackers." It's a good question.

Somebody else in a magazine, in a letter to the editor, said, "I think maybe he's going through a mid-life crisis, that he's now looking back on all the time he's spent in the basement with a computer and he's saying, 'gee, there's a whole world out there.'"

But in fact, I don't think computers isolate us at all. I think people who isolate themselves are going to be isolated whether they use a computer or not. But this also buys into this New Luddites attitude, that somehow computers are spoiling our lives. As I say, as somebody who went through the, you know... It's actually not fair to call them Luddites; the actual Luddites were mostly men who believed that their jobs were threatened by the new technology, and they were smashing equipment to save their jobs. The New Luddites are hardly blue collar; [they're] a lot of PhDs telling us that this is going to ruin our lives.

So let me tell you two stories and then if there are questions about life, the universe and everything I'll answer those. I'll tell you two stories about computers.

I have a four-year-old son who tends to get high fevers. I think he's growing out of it now, but when he was about 2 or about 18 months old he would get very high fevers that would spike very fast; it would go up to like 105 — I mean, I'd be dead, you know. But this [one time], at 102, he's running around playing ball. And sometimes, when children are subject to high fevers they get what's called a "[febrile] seizure," and that's simply where the brain is overwhelmed by the rapid rise in temperature and the child has a convulsion. This is what happened to my son.

I was at work at the time. We had a paper hanger in [the house working], and I get a phone call from the paper hanger saying "your son has had a convulsion, your wife is on the way to the hospital." I mean, that's the worst possible thing you could hear in the world.

Off to the hospital I go, the emergency room. Well, long story made short, [febrile] seizures do not harm children. Our pediatrician told us that. He did say there was a theory some years ago that there might be a link between them and the development of epilepsy, but for the most part there's no real danger to kids. But it is a really scary thing to see, and you have to guard your child so that when you see the temperature going up, you have to give them Advil or something, so on and so forth.

I really wasn't satisfied, it wasn't enough information for me. So I went on-line — and I'm the guy who said I don't talk to strangers — but I went on-line and I went into the MedLine SIG, on CompuServe. Now, I'm not pushing CompuServe just because *U.S. News* is on CompuServe; there are these groups on every on-line service. I chose MedLine. MedLine is populated by mostly medical professionals. And I posted a message and I basically told them what I just told you, my little boy suffered a [febrile] seizure, I'd like to know more about this.

Next morning I logged on, and here's a message from a woman who identifies herself as a pediatrician and a mother of four children, and she said she spent a lot of her time reassuring parents about febrile seizures, there's really nothing to worry about, the worse thing that can happen is when you put the child in the bathtub with cool water, trying to lower the temperature, you want to watch the kid doesn't hit his head; and the other worse thing that can happen is that the parents freak out and there's permanent damage to their psyche because of this.

That evening I logged back on and here was another message, this one from a man who identified himself as a pediatric neurologist, who gave me the history of the original studies that pointed a link between [febrile] seizures and epilepsy. He explained to me that the original studies were flawed and said you have really nothing to worry about.

I printed this information out and I gave it to my wife, and this is what I have done ever since. When I have a question, I go on-line. I want to hear what other people have to say. Now, people have said to me, "Well, how do you know he was really a pediatric neurologist? He could have been just posing [as one]. How do you know she really was a doctor?" Well, you know, I guess the simple answer is that I'm not that stupid, and the information that they gave me squared with the information I had gotten from other professionals. If they had told me to sacrifice a goat or something, I might have gone on The WELL at that point and checked it out there.

So I find myself in the position now where I no longer buy computer equipment, I would no longer by audio equipment, high fidelity equipment, I would no longer buy video equipment. I'm not sure I would really buy anything anymore of a substantial nature without going into the network world and saying, "Hey folks, what do you think?"

It's a very small town. I did this with a hard drive recently and I had trouble. It was an internal and I had a little trouble installing it, so I went in and said, "I'm having a little trouble with this." I get e-mail from somebody — I'll give them a plug, from APS — and it says, "I'm one of the help people, I saw your post." He's lurking, you know. He said, "I saw your post, here's my beeper number, if you have trouble call me at home over the weekend." They've got all my business now. I'm not going anywhere but APS at this point, because they have a customer relationship with me.

So this is a whole new world, a whole new world. The last story is about isolation, or the lack of isolation. And it has to do with a visit I made to Boston about a year ago.

[Tape change]

Vic Sussman: [I was] in a condominium, staring at the Atlantic Ocean, totally zoned out, but I logged on one morning to get my e-mail and I had a letter and the letter said, "You don't know me..." I love letters that start that way. I think it's from Kantor and Siegel when I get mail like that, you know: "You don't know me but, you can get your green card."

This letter said, "You don't know me but we talked a year ago on CompuServe, and you might wonder where I am right now and I'd like to tell you." And then he typed in his latitude and longitude — of course I instantly didn't know where he was — and then underneath that it said, "I am steaming through the Arctic Ocean on an icebreaker, headed for the North Pole." And of course I immediately wrote back and we started a correspondence.

Now, our correspondence was a little hampered by the fact that he was using a laptop on the icebreaker, bouncing the signal off the Lincoln 9 experimental satellite, which I believe is MIT's, and that signal was then sent to the University of Miami, which then put it onto the Internet which then eventually got to me. And so we continued to correspond and the guy happens to be a really wonderful writer, so I was getting these wonderful, wonderful travelogue letters from somebody on an icebreaker steaming toward the North Pole.

Some time in mid-August I got mail... By the way his name is Mike Powers, and he's the commander of the U.S. Coast Guard icebreaker *Polar Sea*, which is the largest non-nuclear icebreaker in the world. I must tell you that before I met Mike, I didn't know a lot about icebreakers. I [now] know a lot about icebreakers. Anything you want to know about icebreakers, I'll tell you. And so we continued to write and then some time in mid-August I got mail and it said, "Greetings, Vic, from the North Pole."

Now, I felt like I was 12 years old. I mean, I was 8 years old with the crystal radio again, it was Santa Claus writing me, it was unbelievable. I am sitting at my computer, staring at the Atlantic Ocean, and I am getting mail from someone at the North Pole.

I immediately wrote back and I said, "Mike, I've [never] heard of anyone sending e-mail from the North Pole. Would you check and see? You may be the first. And indeed the *Polar Sea* was the first to do that. They were also the first United States surface vessel ever to reach the North Pole.

Then I get mail from Mike and he says, "We're now steaming down through the North Atlantic, we're going to go down, we're going to go through the Panama Canal, and we will be the first U.S. surface vessel to circumnavigate North America and we're going back to our home port in Seattle. Oh, by the way, we broke a propeller blade at the North Pole, we have to put in for repairs at the Coast Guard support center in Boston, and we will be there."

Now, at this point, if your hands could shake while you're holding your laptop, my hands would have been shaking, because he tells me the date he's going to be in Boston is September 10th — and I am going to be in Boston on September 10, because I'm attending the 25th Anniversary of ARPANET. So I e-mailed back and said, "I'm going to be here." On September 11th, I walked up the gangplank of the U.S. Coast Guard icebreaker *Polar Sea* and shook hands with Mike Powers, and took Mike and his wife out to lunch. They are now back in Seattle.

This has turned into a constant friendship, by the way. Two or three months later, Mike steamed down to the South Pole and we continued to correspond. I toured the ship, I have the pictures to prove it. I would just tell you, given my personality and my background, that I don't meet a lot of Coast Guard commanders, of icebreakers or otherwise. And, at the risk of sounding a little flag-waving, I would also tell you that until this friendship occurred — and it could not have occurred any other way except the way it did — I had no idea how much the military gives to the people in this country. And it has changed me in many ways. My political attitudes in some sense [have changed], and certainly my attitudes towards people in the military have changed drastically from the way they were say, in the '60s.

So when I read Cliff Stoll and Kirkpatrick Sale telling me what a terrible technology this is, and how it's going to isolate me and how it will destroy public spaces and we will all be in our basements and we will all be on stupid chat lines — it's absolutely ridiculous. What we will be doing is what I'm doing now. We will be meeting new people based on affinity.

It is now the death of distance, and we are no longer prisoners of geography. And we have a chance to do things and to talk to people. As good as the Border Patrols around the world are they cannot frisk electrons at the border. And so we have an opportunity, I think, for a real new world.

I leave you with one thought from John Perry Barlow, one of the savants of cyberspace. Two thoughts from John, whom I've never met by the way, we've only shared e-mail. I once wrote John and said, "I think this is the greatest thing since movable type," and John wrote back, "No, since fire." And then we were talking last January, when I was doing a cover story about policing cyberspace, and I'll leave you just with this last thought from Barlow. He said, "You know, people down in Washington have the attention span of ferrets," and he said, "instead of worrying about how to regulate this new technology, what they should really be thinking about is whether there will be a government in 20 years. Because this technology is so destabilizing, that it will change our lives forever."

Thank you very much.

PUBLISHING ON THE INTERNET INTERNET PUBLISHING: THE HYPE VS. REALITY



MODERATOR
Walter Chavez
Web Developer, iWORLD

SPEAKER
Brad Templeton
Chairman and Publisher, ClariNet Communications Corporation

Walter Chavez: Good afternoon, ladies and gentlemen. Welcome back from a good break. Going right on with our schedule this afternoon, the next speaker that we have is Brad Templeton, Chairman and Publisher of ClariNet Communications Corporation. He has been working for this electronic newspaper, which has been on-line for over six years. He's also been doing publishing on the Net for over eight years, and he'll be talking to us this afternoon about "Internet Publishing — The Hype vs. Reality." The format of this session will be 45 minutes of Mr. Templeton speaking to us, and then 15 minutes of Q & A.

Brad Templeton: I've come to you to speak about publishing on the Internet because I have been doing it longer than most of the people, [and I] certainly have tried it probably as long as anyone. There has, of course, been a great deal of excitement. What I call "The Information Super Hypeway" sprang up about a year and a half ago, when Al Gore got very excited about it, and suddenly everyone thinks that the Internet is the complete revolution in publishing. It's not happening quite that quickly, but a number of interesting things are happening.

I've come here to address some of the experiences I've had in publishing in different ways on the Net, to tell you what things aren't happening that some people are hyping about, to tell you what is happening, and to tell you a little bit of my own hype about what may happen in the future.

I'm going to talk about the way that we publish and the way that a lot of other people publish using the technologies of the Net, such as the Web and UseNet newsgroups. I'm going to talk about how people are charging for information on the Net and trying to make a publishing business, and how they get that revenue. In particular, I'll talk about what they've been doing with advertising and what we do with subscriptions. And I'm also going to talk a little bit about how people who provide information to publishers are paid.

To give you a bit of the background that I have and why I should be listened to about this subject, I've been involved with the Net for a great deal of time. First, I got on my first ARPANET mailing list I think in 1979 — which is way too many years ago — and started bringing UseNet into one of the first international newsgroups in 1981. In 1986 I started the creation of what is still the most widely read thing on the Net, even though I don't do it myself personally anymore: a special newsgroup called rec.humor.funny. I hope that many of you are familiar with it. If you are familiar with newsgroups, and I hope you are, rec.humor.funny was one of the first attempts to try and do something that was a professional publication in the Net world back in the 80's, before Al Gore had discovered the Net. And it consisted of an edited comedy publication.

There are lots of people on the Net these days who love to trade jokes, and I don't think any of you who have an e-mail address haven't managed to have some friend send you the latest joke into your e-mail box. Rec.humor.funny was an attempt to receive the best material; I would pick from my own subjective opinion and send out only two messages per day. This was something that everyone could handle, rather than a hundred messages that were mostly

arguments about whether something was funny or not — which obviously amused you when I described it — but unfortunately that joke wears a little thin. Instead we would give people the best two messages a day, and that actually very quickly became the most widely read thing on UseNet.

Now, are most of you familiar with all the different Internet publishing technologies and know what UseNet is? How many of you are squirreling up your head in confusion when I say UseNet? Okay, that's good, a couple of you.

The Internet is really just underneath a "point-to-point" network, and what really makes the Internet different and what makes it happen are the applications that run on top of it. The people who use the Internet, the people who run these applications, use the Internet as a medium to get data from one place to another. The electronic conferencing application that is most common on the Internet is called "UseNet electronic conferencing," meaning people having electronic discussions with people sending or posting a message and expecting a bunch of people to read it and then respond to it in what are sometimes called "bulletin boards," or "forums" or "SIGs," whatever on the on-line service [calls them].

The Web is the technology that people use to browse and move around through bodies of information. It's not commonly used for discussion; UseNet is the technology that's used for discussion. It also, as it turns out, is interesting as a publication technology, and I'll explain some of the reasons for that later.

Anyway, that quickly became the most popular thing on UseNet. Recent surveys, much to the surprise of many, actually showed that reading newsgroups — at least among the survey body of the most recent survey I saw — is still a more common activity than browsing the Web. E-mail still is the big winner. The Web has, of course, been the big surge; the Web is a newer technology, it's much sexier and it has a number of capabilities that are not found in a system that was designed for conferencing that are also very nice. And there are actually merits to both methods of distributing information, as you'll hear.

I'm also the publisher at a company called ClariNet Communications. Back in 1989, after I saw that these jokes, which was just something that I did for fun as a hobby, became one of the most popular things on the Net, I resolved to find out whether or not you really could make a publishing business on the Net to give people actual professional edited information and see if they'd pay you money.

That led to the formation of the Net's first electronic newspaper, which publishes in the format I just described and is also read on the Web. This electronic newspaper, which we sell into sites, has just passed having one million paid subscribers. It is not free like most of the information on the Web. People get it only by paying a subscription fee, which is a flat fee to receive it.

Both of these, I think, are reasonably good success stories — or at least I like to think so — and because of that I've developed certain perspectives on just what works and what's being hyped in publishing on the Net.

I guess I certainly bought into — and still buy into, to some extent — the basic hype concept that excited everyone about the Net in the early days when people spoke philosophically, and that was this idea that anyone's a publisher, that there is no barrier to entry to publishing, that anyone can write something and put it out and have it be read by a large audience and the result of that would be a content bonanza. If everyone could publish, well, then everyone would publish and all kinds of great information would be out there. And, of course, "content bonanza" is not exactly the right word; having everyone publish turns out to actually create another problem.

It creates what some people call "infoglut," and it creates a great difficulty in finding the relevant information that you're actually looking for. People thought that publishing houses

would be dead. People thought that the idea of having a *Random House* — or even a *New York Times*, for that matter — was something that wasn't going to exist anymore, that with a barrier between the writer and the reader there was very little need for all the great mechanisms and all the dead trees that are knocked down in order to print those things.

Now, I actually agree with getting rid of the dead trees. One of my mottos used to be "It's wrong to ship data in trucks," and I don't need to preach that anymore to the Internet audience. Everyone here pretty much agrees that shipping data in trucks is a bad idea, although there's still a pretty big CD-ROM industry that is shipping the really, really dead trees, since that's what plastic comes from, in trucks. But they're a little more compact, and they've had the benefit of several millions years of data compression, I suppose you could call it.

Another thing that sprung up with the Net, and it's both a myth and true — which I guess makes it the best of aphorisms — is that information wants to be free. There's a large belief that everything on the Web and on the Net is free, must be free, can't work if it's not free, and this has caused people to believe that advertising is the only reasonable model for information publishing in the electronic world. That isn't true, but you'll certainly see a lot of people believing that. Just about every new Web service that I've seen on the show floor here and in other announcements recently has expected that it's going to get its revenue from advertising. People believe that they can put their URL on a shingle effectively — to bring out the old metaphor — and the world will beat a path to their door. That myth actually was dispelled pretty quickly; a lot of people have realized it's not enough just to put up a Web server and say something.

The other myth that certainly is not true, although there are other things to it that are true, is that the Web is the Home Shopping Channel. I must admit to a certain failing of my own here, that the success of QVC and the Home Shopping Network and similar channels was a great surprise to me. I normally think that I can predict what's going to be a good business success, or at least something that's going to become a billion dollar company overnight; you hope that you knew in advance that it would be something. Unfortunately, I don't believe that the Net consists of people who have no lives, who spend their days watching cubic zirconia spin on the screen. And most of the sales of the home shopping channels still, surprisingly, are for the costume jewelry.

It's a very different audience on the Net. They're not going to buy things the way that people have bought on the home shopping channels, but they might buy very different materials and there is still, I think, a bit of untapped potential there. But the simple attempt to move the old styles of television and catalog shopping into the Net are not necessarily meeting with big success. Some things, some more unusual products, are.

Let's discuss the different methods of Internet publishing. (I'd like to have a [lavalier] mic; it kind of makes me stay still when I have to sit in front of this thing.)

The Web is, of course, the current method of Net publishing, and it's certainly the most advanced technology that there are non-proprietary viewers for. Certainly everyone agrees that some of the newer technologies, and even some of the old technologies that could display multimedia data, were more sophisticated than what the Web can do. **But the key, of course, to publishing is — as I discovered fairly early on — you can't try and sell somebody a consumer document at consumer document prices, and tell them, "And by the way, you just have to buy this \$20,000 computer and this \$10,000 software program to read your \$1 document." That's not going to happen.**

But you can instead get a critical mass of people who already have the tools to view the information — and even almost as important as already having the tools, already know how to use the tools. Again, you can't hawk newspapers on the

street if they need a user manual with them in order to describe how to read them. And it's very important, I think, if you're going to be in the business of selling content rather than in the business of selling technology, that you use technology that everybody already knows how to use and hopefully already has.

So the Web certainly is something that's come to meet that qualification. And that, of course, is what has excited people about the Web.

It does suffer from a few problems, however. Everybody knows that the Net is not 100% reliable, that many servers are faster than others and many are quite slow. We've all seen the standards wars that have been going on, companies like Netscape, which surged in early and took the market away from companies — well, not companies, but groups like the NCSA — which surged in early and thought they had the market. They have, of course, tried to do it using all their own techniques. Many people applaud that and say, "Good. You know, standards meetings are a big waste of time."

And I actually have a bit of sympathy for that philosophy. Nonetheless, competing standards will defeat the principle I just described. If your goal is to sell content you really don't want to spend a lot of time convincing people to buy technology in order to sell content, particularly if you're looking at the mass market. If you're looking at selling \$10,000 or \$500 a year in newsletters to people, it's OK if you have to sell a little technology along with it. But if you're looking at just selling ordinary consumer information it's not going to work. People have to have the tool already, and if there are a lot of competing standards then that, of course, goes against what you want.

Everybody knows the example of the compact cassette, and how standardization made that happen when before, with the previous competing standards, they couldn't make it happen.

The other application that is still happening is the dedicated applications, and they have that problem I just described. They include, to some extent, *Acrobat* and the upcoming *Blackbird* application from Microsoft. However, what's happening is that these people realize the exact point I'm making and they're working to see if they can make their dedicated applications ubiquitous.

Netscape made a very bold move, an example of a certain Net phenomena that I'll characterize later, in giving away their browser free in order to get market acceptance for it. When they first came out and said, "Hi, we're going to be a commercial browser company," I said, "Well, that's kind of interesting, but you're not going to get anywhere." And to myself I said, "Unless you've got the guts to give it away free." So anytime someone does something that, [something that] I think is a good idea, I believe they're a genius. And they did do it and they did manage to capture that market share.

They followed an interesting principle, a principle that no one expected to be the case. Those who were on the Net in the very early days knew, at some point, that this was something exciting. Everybody knew that this was the next generation of something. We didn't know what it was, but it was the next generation of something. And we knew that at some point people like Al Gore would discover it and there would be a flood of excitement about it, and everyone felt that this discovery would be about as productive as the Native Americans felt about their discovery by the Europeans.

As it turns out, it wasn't at all like that. What's happened instead is that the bulk of the world has come and embraced the Net and said, "How can we be like you?" This is not what the Europeans did to the Native Americans — at least not until we started making movies in the late 20th century. And this is just a very different phenomenon; it's not like the normal social — the normal conquests, or what happens to anything when the general public discovers it.

Netscape did the same thing. I mean, Netscape's move would have been considered crazy by people in the traditional software industry, to give away all that software. Now, you know, I don't mind if people call me crazy if I have a three-and-a-half billion dollar market evaluation.

Anyway, the dedicated applications do have to face that problem, and I believe they're working on it. I mean, Adobe's original plan, as an example of this, was that they would sell *Acrobat* viewers. Are most of you familiar with Adobe's *Acrobat* technology? It was another attempt at electronic publishing — well it is [electronic publishing], I shouldn't call it an attempt because I think it still has some life in it, certainly. And they originally said, "We'll sell these viewers. We'll sell the filtering tools and the 'distillers,' as they call them." That wasn't going to work, and it only took the big lesson of Netscape to teach them how to work in the Net world.

Nonetheless, if you're going to publish documents, unless you have a very specialized application you need something that all your viewers have. You don't want to tell your viewers, you don't want to tell your readers, what they're supposed to use in order to deal with your documents.

Some people actually think we're a little bit strange because we still use the newsgroup technology. It's certainly a more limited technology in terms of what it can display and how pretty the material it can display is; and its access control facilities, the ability to give information to some people and not to others, are limited to site-based controls. You can't say, "One person gets this and another person gets that." But it's been around a lot longer and it's standardized reasonably well, and it's actually very efficient.

The technology of electronic conferencing systems — in particular with UseNet — is distributed. When messages are posted to a system like this they are transmitted out to all the neighboring computers of the originating computer, and then they share it with their neighboring computers if so authorized, and so on and so on. "They tell two friends, and they tell two friends..." to paraphrase the old shampoo commercial, and that floods the message around the world. And then everyone reads it locally on their server.

Recent technologies have made that very fast so that the propagation takes place in minutes, where in the old days it used to take days, and that had an interesting effect on the caliber of the conversations. But today it's all very quick, and the nice thing is that if you know a lot of people are going to read the information — which is sort of the goal of publishing, at least on a large scale — the information is put into their server in advance, and when they go to access it they get it at the speed of a local area network rather than at the speed of the Internet, without using their own Internet pipe.

Another often-overlooked but still very productive method of information publishing on the Net today is e-mail. A lot of people find it very unsexy when I say that e-mail is still really the killer app of the Internet. People who have not yet experienced having e-mail links with their suppliers and their customers and the people they do business with don't realize what it is. I mean, it's hard to imagine even the days of fax after you've spent a little while in the e-mail world. It's actually overwhelming sometimes, and we need to learn exactly what the right level of e-mail is. But nonetheless, it's still a very powerful application that most of the world has identified, and still the number one application of the Net. And with e-mail, of course, you can control who gets something.

The only real disadvantage it has — well, there are two disadvantages. One is that there's not enough standardization in mailers for sending multimedia documents and doing interactive things. I'm sorry; that's the third disadvantage of the two I was going to list. The

display formats are more limited, and you can't do interactive stuff. But other than that, of course, you can direct information to the people you want, and they'll get it and it comes to them — which is one of the other disadvantages of the Web.

Right now, the Web is something that people have to go out and get; if you want to get a Web page you have to remember that you're going to that Web page to get information, and you don't know — unless you use some rather unusual tools that have recently come out — that a Web page that you're interested in has changed, or that there's new information for you there.

The Web is still a browsing technology. There are some new exciting details, things like *Java* which include the ability to push data out at servers or at clients once they've already made a connection. And if you've ever experienced the magazine *Hot Wired*, most of you may have run across that. *Hot Wired* learned that when they were doing their magazine people would come, look around *Hot Wired*, and then they just wouldn't come back. They figured it was another Web site, and that's what you do with Web sites — you look around them and you don't come back to them. So they figured, "We'll actually e-mail people what the new stories are," and when they e-mail those stories out that gets people to come to *Hot Wired*.

Another reasonably successful — small, but a good model of a small successful electronic publication — is a magazine called the *High Performance Computing Wire*. This particular group of people sends out information on supercomputers, and they e-mail to people all the headlines when they generate them once a week. They get a summary of the headlines, and then the people go back and can query from various servers the stories about high performance computing.

This pushing data at people is what I think is sort of like home delivery as opposed to going to the newsstand to get your newspaper; and that's why we like the technology that we use. Newsgroups and electronic conferencing systems, while originally meant for discussions, actually have a number of facets that are useful for reading constantly changing information, that were meant for reading constantly changing information. So they keep track of what you're interested in, and what you've read, and they present to you what's new that you haven't read before.

Again, that's something that the Web doesn't do, although I'm sure it will do at some point in the future.

File delivery is sort of the last and probably the oldest of the methods of electronic publishing. It's still being used by a few people out there. You will find that some people — for example if they do have a very customized piece of information — will simply send you a file, and you'll drop the file into your Windows system and you'll click on it and then you'll get some kind of interactive application that gives you information. And that obviously, in the end, can be very flexible, because you can send someone programs as well as data and, assuming they trust you, you can send them programs that actually do things. But on the other hand file delivery is itself pretty cumbersome, and as yet there's no real easy way to just nicely shove files at people, simply because of the trust issue. People are not just going to randomly run files that come in from anywhere on the Net.

Multimedia have, of course, excited people. (I got to just use "media" in the plural, and that makes me very unusual.) Pictures and graphics are necessary to really excite the general public, and for them the Web is the most advanced technology in displaying that sort of material.

The problem, of course, with using that on the Web is that if you want to do really serious pictures and graphics you run into a problem, because of the speed of your own lines and also because of the speed of the lines that the customers and readers are using. There are just too many people in there who are still using 14.4 modems; and it astounds me, actually, to

see the Web pages that some people put up. They put up a 90KB graphic — and I have a T-I, it's a very nice toy and I think it's a lot of fun — but I just can't imagine how people are reading that sort of material on slow, modem-based links.

The nice answer to that, as has always been true in the computer industry, is that being too big and too slow is a problem that hardware fixes for you if you wait a little while. In fact, in the very early days of the computer industry I remember a number of friends of mine who made themselves quite rich by writing programs that no one would possibly want to use, because they were impossibly slow on the current hardware — and a year later they were the only ones who had an application, and it happened to run okay on the hardware that they had, or it came out later. So let's not deny the value of that.

Graphics are going to become cheap, and particularly if standards develop. There are also a number of standards that are better at sending non-photographic graphics than the ones that are used currently.

[My next point is about] video. I definitely think it is a toy right now. Video compression technology is not nearly good enough to be used with anything but the really, really fast lines that are out there. You will find Web sites that will download a video to you, but I don't see people practically publishing video to people any time in the near future. That needs not just slightly better or twice as good bandwidth or twice as good hardware for communications; it needs orders of magnitude more improvement.

Of course, there are people who think that video is the only purpose of the "Information Super Hypeway." When it was first announced, many people announced their vision was 500 channels. This is what we do with all this, this great data network that we were going to build — give people more TV. My expression of that is that's kind of like the horse breeders back at the invention of the internal combustion engine reveling at how much faster they can ship horses to people. I certainly hope — and when I talk about advertising I'll tell you a little bit more about why I hope — that TV isn't the model of the information world of the future.

[The next topic is] sound. When I've wandered the show floor here I've seen a lot of people that are very excited at the sound-based companies that are out there. I still am a little bit unimpressed, because again, it's sort of like the talking dog. I mean, it's neat that you can do it at all, but the sound technology isn't very good for most people. I don't think I have to do phone calls over the Net.

The sound bandwidth, however, is probably the first multimedia thing — after graphics — that's going to come within range in a very short amount of time.

On the other hand, I happen to think that sound for publishing is not all that exciting. When it comes to news, which is my business, you're not going to really be hearing someone say something; it just doesn't add that much to it. I mean, radio has a purpose. Radio is there when your eyes have to be somewhere else, when you're driving or when you're jogging or something like that, or you're working around the house. And radio will never die because there will always be environments where our eyes do something else, and we would like to be informed or entertained.

But when we're actually staring at something, the truth of it is that sound is sizzle rather than steak. And while I'm sure people will include it and I'd like to see things done with it, the truth is that the meat of the matter is not going to come from sound.

Text, on the other hand — all the media do that great. We've certainly started with text, and we did nothing but text, nothing but plain text, for the first several years. We only moved a year or two ago to doing things like comic strips and photographs and stuff like that.

You have to decide, when you're doing this decision about all the multimedia aspects that you can publish, "Are you selling steak or are you selling sizzle?" That's not a facetious

question. A lot of people, a lot of publishers and so on, are just selling entertainment, and what they want to do is give people some sizzle and make them feel happy.

There is real content in *Wired* magazine, and it's just in the wrong color. Perhaps some of you have seen a new magazine called *The Net* — if you could figure out that was its title. How many of you ran into it? My description of this was a magazine for people who didn't think *Wired* and *Mondo 2000* were garish enough. So there seems to be some demand for sizzle here in the Net world.

Why do we use UseNet technology? Because it is the older technology and doesn't have as much sizzle to it — although today you can do multimedia stuff and it can be read by the most number of tools. It can be read by all the UseNet newsreaders, and there are lots of them that are free. There are a number of Windows and Mac-based ones, some of them as commercial products. And while not everyone knows it, there's actually a pretty decent one inside *Netscape*, which is of course a Web browser.

In fact, they've actually put a lot of effort into it, as you can see if you've looked at the new beta version of their next release of *Netscape*. They've actually decided to make the newsreader a very specific and special-effort, extra application that runs inside the *Netscape* environment. Maybe *Netscape* will — what was it that someone said? This is actually true. Someone once said that in the old days of UNIX every program expands until it can read mail. And that's already true of *Netscape*, so maybe we'll start seeing that every program expands until it becomes an operating system, which is where *Netscape* certainly seems to be going.

One of the main things that I think is important — and I argue with people about how important this is — I'm a speed freak. I believe that everyone, once they're given speed, is a speed freak as well. How many of you remember how excitingly fast you thought your 2400bps modem was? I certainly thought it was great, and you couldn't even stand to touch one today. So once you're given speed, you want it. And I like the idea of putting the information in advance into someone's machine; because you know they're likely to ask for it, so that when they do ask for it it's there. Once you have it you can't go away from it; you can't sit there and watch a little meteor shine past that "N" for twenty seconds. I mean, do I detect that other people are tired of watching that meteor go by? Just a guess.

No, obviously you can make the meteor go a few less times with faster servers and faster bandwidth, but nothing beats having something on your own Ethernet; and that's one of the reasons that I think that pre-feeding the information has a lot of value. If your people are going to really use it, really go through it — I mean, there are people who are information junkies, some of them our customers, and I think the early adopters and the people who talk about stuff are definitely these kinds of people. And the ability to go bang, bang, bang through information is not to be underestimated.

As for pictures, and I suppose eventually for video and those other multimedia things, it's a real difference. We've decided to — I try not to plug too much in talks, but I'll plug it here — which is to say that one of our announcements at this show is that we're doing wire photos with the news, and that they look very nice. We've decided to release them in two sizes. One is a modem-type size, a 9KB picture that you can download on a 280 modem in just a few seconds, and the other one is about 60KB or 70KB and really looks good.

My impression is that strictly because it's in color, if it's not really big it hasn't got more resolution than a newspaper picture has in terms of hard pixels; but because it's in color and it's on a decent screen, I think it actually looks better than the same picture in the newspaper. But it needs to be about 60KB, which just isn't practical at all for someone who's getting it over a modem, or for that matter even over a 56KB ISDN link.

On the other hand, if it's on your LAN you can get it as fast as your computer can render a JPEG, and that makes a big difference. Photos are a little bit more sizzle than they are

steak; they have some information in them and they're useful, but when you get a picture up — zap, on the screen — or a comic strip — zap, on the screen — it makes it something you'll really do rather than something you'll play with.

And while most people at this conference won't admit it, right now the Net's a toy to most of the people who are on it. People are playing with the Net and there's... Look, there's real information out there. You can get Dun & Bradstreet reports and you can get stock quotes and stuff like that, and a lot of people are using those. But there's a lot of people still playing, and if you want people to seriously use it you want to give them all the speed you can.

The other reason we use it is that — at least according to that survey that I read recently and some other information that we have — it's about as popular as the Web, maybe a little bit less, maybe a little bit more. And it's also, as I mentioned, a medium of sending information to the user, home delivery rather than going to the newsstand.

News is supposed to surprise you. A lot of people think that the ideal electronic newspaper of the future is a mechanism that they go in and browse and they enter a keyword and they find the news that matched the particular keyword that they're interested in. That's actually something that's existed for a long time. The on-line dialogue and Nexis database services and several others have done that for some time.

I believe one of the things that we value about news is that it comes at us and that it informs us about what's going on in the world that we didn't even know about, that we didn't know we were interested in. And to do that, it has to come at you. And I think that's very important, and this is one of the things that technology does.

It turns out that this technology, because it was simpler, only allowed us to control what site would get something, so that we can say, "This site." You all know what I mean by a site? It's not an individual Windows workstation, but it's actually a LAN or a server computer, the dedicated server computer — or not necessarily dedicated, but a computer that's up all the time and typically running a multi-tasking operating system, like UNIX or one of the other various multi-tasking operating systems.

I suppose Windows NT also has a number of such server tools for it now; the Macintosh, unfortunately — as I often say about Apple, multi-tasking was only invented until about the mid-60's, and I think Apple will get it ready some time in the 90's, if they actually get around to it. It's true. I mean, they just don't multi-task very well. And it's sad, actually, because there are a lot of good things on Macs, and a lot of people run Macs and it would be nice if they could do those things.

A site is a group of people rather than one individual. I think this turned out to be, while initially perhaps thought of as a limitation of the technology, a right move from a business standpoint. It was a good idea, and I'll explain why.

UseNet is still the community of the Net, something that is realized by those who are involved, but not necessarily realized outside. Even people who are designing Web applications use newsgroups and mailing lists to some degree to discuss exactly where the Web should go. The Web is a neat environment for browsing and shifting around through information. It's not yet an environment for discussion, except with a few specialized environments in places like *Hot Wired*.

The revenue model that we follow is subscriptions. We do not take advertising at this time. We sell subscriptions, however, on a site basis. And the reason that I said we were sort of forced into that decision — and it came out to be a good idea — is because so far we're not seeing any reports of — we're looking around, and that doesn't mean that our search is comprehensive — but we're not seeing any reports of people making a lot of money with individual subscription sales of Web services. Which is to say, "I have a neat Web site with content or whatever else it is, and if you pay me \$5 a month or one penny a hit, or whatever it

is that you want to pay, you can get access to my Web site.” There are a number of people who are offering services like that.

A number of the other electronic news offerings are working that way; there are people who will give you stock quotes, there are people who will give you all kinds of other information sources, and the truth is that their subscribers still number in the low thousands at the very best. None of them are profitable businesses unless they have very, very low costs at this time.

We also feel that there is a problem with subscription Web sites because I think there’s a limit on just how many sites a person is going to subscribe to. I mean, you’re not going to realistically maintain the bills from 30 different Web sites or pay fees to 30 different Web sites or, in the current technology, remember passwords for 30 different Web sites. And that’s probably one of the barriers that’s interfering with people doing subscriptions in that sense.

Again, the Web is something you have to go out and do rather than it coming to you. It’s much easier with magazines to subscribe to 30 magazines, although most people don’t subscribe to that many. The password system they currently have turns users off, but I think that that’s a technology thing that’s going to be fixed.

The winner for us has been site-licensed subscriptions, and that’s for several reasons. I think one of the key reasons it’s been a winner is that it really mirrors the way the Net worked and what made the Net a success, and that was flat rate pricing for everyone. The thing that made the Internet different from all the other Nets that came before it was that you, your company or somewhere that you were working, paid one flat amount of money; they got a connection and then everybody was told, “Go play. Do whatever you want. Use as much as you want. Use as little as you want.” Some people will use a little, some people will use a lot, and it won’t cost you any different depending on what happens. This caused people to go out and say, “Well, you know, I’m going to put up an FTP server and I’m going to serve up files for people.” And they came and they really liked it, and it became a positive thing.

In the old days, when people had to pay as they played, if you were to put up a file server on, say, the old X.25 network — which really had all the capabilities, in a way, in terms of one computer being able to talk to another — if you were to put up a free file server your boss would fire you. “You’re causing all this traffic on our network, it’s costing us a lot of money in packet charges. Go away.” And things like the Web server just would never have been experimented with.

The idea of a Net where people could play and experiment and not have to pay different amounts of money caused the Net to happen. It caused people to design the Web and the Web protocols, and caused people to put up neat Web servers, and narcissistic Home Pages and all the other things that made people excited about the Net.

Well, on the other hand, this site license principle works very well, and it’s what people on the Net are used to. And like the Native Aboriginal Americans being discovered by the Europeans, the outside world’s marketing rules don’t always work on the Net, but site license does work on the Net. It’s what people are used to. It’s how they pay for things on the Net.

We think that the opposite technology is “micro-transactions,” which is my word for what you see from the various digital money schemes. Many of them advocate — not all of them, but many of them — advocate the ability to buy this document for one-tenth of a cent and this document for two cents, and this document for five dollars, and just go around and pay digicash or cybercash or some amount of money for that. I don’t think that’s a good model at all for the Net, and I’m not sure how I’ll go into it.

The thing that I think actually is going to be the successful model is bundling of services together. I think that you need to have a lot of different services. One of the things that we think has led to our success, rather than an individual wire service like Reuters trying to sell its

data to the Net and getting people to come in and pay money either in subscription fees, micro-transactions, or through ads, is that we put together six or seven different wire services and combine their information in the same way that newspapers did, the same thing the wire services do, in just about every town in the world.

People are much more willing to pay for lots of different premium information sources. Then we divvy up the money and pay royalties to the people who provide us that information, and we think that making that bundled package gets people very happy, and they buy our service where they wouldn't necessarily buy the individual services one at a time.

Cable TV has, of course, been based on the same model, and several people in the on-line world have also worked in that model. The only reason they've stopped doing that flat-rate bundling is because it was too successful, and it got too many people and they had to pay a lot of costs to maintain their systems to do that.

Now, there are a lot of ad-supported Web sites out there, and that seems to be the model that's excited most people. I haven't talked too much about it. We don't take ads, as I mentioned. It's not that we really think that we couldn't have made some money from ads. I think that if advertising becomes a big successful model, then it won't really be that hard to find out who's advertising with other people. Unlike secret client lists, you kind of have to advertise this one. So that doesn't scare me too much.

I'm a little bit scared at the idea of the Web becoming like television, that if advertising is the only way that content is supported we'll only get the kind of content that advertising supports, and that concerns me a little bit.

But nobody really knows what to charge for advertising. Right now all the advertising on the Net is "let's see" advertising. It's not, you know, the old style advertising in traditional media that has been around for a century, where people say, "Okay, this ad cost me \$3,000, I got 2,000 leads from it, 500 people bought something. I'm going to buy that ad again." That's not happening on the Web right now. People are saying, "We'll buy an ad and we'll find out what happens."

And that's interesting, but it's not a business yet and nobody knows what to charge or even what they're getting from it. Some of the ads that are being sold on the Web right now have ridiculous CPMs — that's an advertising term meaning "cost per thousand people who are exposed to the ad." Prices are way beyond some of the media, which traditionally have been very good media, and it's a little bit of hubris to suggest that the Net will support that level of cost.

Just a side note is that classified advertising is the source of 40% of newspaper revenue approximately in the United States, and thus one of the most significant types of advertising in the world. Yellow Page advertising is also classified advertising, and also a very significant revenue source that obviously isn't something that can support content very easily. And it's also, I think, something that's going to become free, like e-mail is today. It's just so easy to do; but I'm not sure that people are going to make a lot of money from it.

Let's go fairly quickly because I do want to get to your questions.

Web ads, if they're going to be successful for anyone, are going to be better for the little guy. I mean, frankly, I see Sun ads on Web pages that I go to, but I sort of already knew who Sun was. It's no question that big companies still advertise and like to push their name in front of people lots and lots, but I think actually the Net, because of the eclectic and rich audience it gets, is probably going to be the bargain more for the little guy who no one has ever heard of, and for the person whose link you're going to click on because you're actually interested to know what they're doing as opposed to the companies you hear about all too regularly through other means.

It is successful right now to run a Web site that's an adjunct to another business, which is to say if you already have a business and you want to promote it a bit, you're already publishing something and you just want to make sure people know you're publishing it. That's a success.

I want to get some of these later points, so I'm going to gloss over these things.

People who love the ad subsidies — my disaffection for ads is probably not going to be recognized in the general public — probably do want the Net to become like television; they certainly wanted television to become like television, so I'm not sure how successful we'll be at pushing away the evil forces of advertising, but I think the Net is probably an environment where it can happen more than it can on television. There are technological ways to do non-advertising-based content on the Net, and there aren't in television, not very easily. And the few that are [in television] are cumbersome, and Pay-Per-View has never been a big success.

Of course, the other difference is that people are learning the difference on the Net between ads that bother people and ads that attract people, and they're realizing that ads that attract people are the only ones that work on the Net. That's pretty positive.

I mentioned micro-transactions, and I think they're an enemy of the Internet in a way, because I believe that the Net was based on this idea of the flat-rate site license pricing. I don't think people want to have a meter running. Most of you live in areas where you can get unlimited phone service or you can get per-minute phone service, I guess. And how many of you get the per-minute phone service for local calls if it's an option for you? How many of you, one, two people? And how many of you make more than, I don't know what the number is, three to four hours of local calls? How many of you who get the unlimited service make three or four hours of local calls every month?

Well, more than I would think. In the place I live the local calling area is very small, and it turns out that most of my friends aren't in my real tiny local calling area, so I still buy the unlimited-rate local calling service because I don't want to pay per minute. I'm not poor, but I don't want to. For some reason, I don't want to pay per minute or pay a penny for every minute that I'm on the telephone when I happen to be making a local call.

It turns out that about 85% of people buy unlimited local phone service, and for about half of them it's a bad buy. The phone company prices it at exactly the point where it will be a bad buy for about half of them, because they want to collect exactly the same amount of revenue when they have, in fact, these deals with the PUC to make sure that they collect a revenue that goes over their costs by a certain margin.

People seem to like that when it comes to consumer electronic services. They don't like micro-transactions; they don't like a meter running all the time when they're doing things. The CompuServe and the AOL way of things is to have a meter running, although even CompuServe and AOL know that [by having] the flat \$10 fee for about half their customers, which about half their customers never go over.

So flat fees made the Internet what it is. Oh, another little hype thing that I would like to mention is this big belief that is prompting the existence of all the security firms on the Net floor, or at least all the people who want encryption of stuff — [the belief] that credit card transactions over the Net are a huge risk. What no one will admit is that there's never been a documented case of someone having their credit card sniffed while it went over a Telnet session or a Web page forum and then having something charged against them.

Because of that, there are stories of people's credit cards being stolen from databases where they were found on the Net, but not packets wandering around over Ethernets and over Net connections. I have given my credit card number over the Net and have had no problem.

The truth of it is — most people don't know it I suppose — but you can invalidate any credit card charge that isn't signed by you anyway. So if someone takes your credit card

number and uses it you do have to get a new credit card, which is annoying, but you're not out any cash. The bank, on the other hand, is very interested in the encryption. The reason is left as an exercise to the reader.

[Tape change]

Brad Templeton: I wanted just to avail people of the idea that in the new electronic publishing world of the future, royalties will be 80%. Some people actually come up and suggest that to me, saying, "What are you doing? I mean, you're not printing. Why should you get the publisher's share and I get the author's share?"

The publisher is not just a printer. A lot of people don't seem to realize that. The elimination of the printing press is not the elimination of all the work that the publisher did. It does eliminate one of the costs, and so royalties can increase.

But the truth of it is, if you look at the publishing industry, the old paper industry, a good rule of thumb that was very common in a lot of publishing houses is that the author's royalty and the publisher's net were about equal. If an author got a royalty of 10%, that's pretty common. And the publishers would make a net profit usually in the 10% range.

So the truth of it is, you can take out the printing, you can take out the distribution, you can take out the retailing and all the different things that you take out; but the truth of it is that the publisher, the work the publisher was actually doing, all that other stuff was always jobbed out in just a cost. The work that the publisher was actually doing still needs to make that same amount of money, in terms of promoting, getting material in front of people, identifying the best material so that people will not have to hunt through and search; all these things still need to be done, and publishers still need to do them. So they're not dead in spite of the hype that they are.

We're still working out what royalty percentage actually is the right one. Some of the royalty percentages from print publication are pretty dismal, mostly because there are a lot of writers who will write for the love of writing rather than as a business and so they'll take a 6% royalty on something. And that is a little bit low, I think, even with the economics of print publishing.

I think those rates are going to go up, but they're not going to become 85%, for example, which some people actually run around and suggest as a royalty. That's actually what your agent gets if you're a writer — you give your agent 15% and you collect 85%, and the agent doesn't do anything but make the deal. Making the deal has its value, and its value is pretty well established, and many people think that agents are a bargain. My father is a professional novelist and he thinks the agent is — well, he's older, so he thinks the agents it the best 10% you can ever spend. But I think he'd still agree an agent is the best 15% you can ever spend.

What am I going to skip over here? Some of the things that are going to come, new trends in publishing. I think that the existence of links inside news is actually going to be a very important, exciting thing. We plan to work on it. I think they're going to create a revolution in journalism, because journalism is typically full of errors — not because reporters are malicious or bad, but simply because they're people, and they have biases. I mean, there are biases in all stories as well, but I think links [exist] inside stories, so that when you read a story about something that happened at the White House you can follow a link and read the White House press release, and read the statements by the people who are mentioned in the story, or that the person mentioned in the story can write the reporter an e-mail 10 minutes after the story clears, and say, "You know, you spelled my name wrong, or you did this or you did that." And if

it's just an ordinary error and not something deliberate it will get fixed, and I think we're going to see remarkably more accurate journalism as time goes on.

I think, also, that publishers are going to start thinking about doing services as well as content. They always did, but they never really thought of it that way. And you already see some firms out there like Excite and McKinley and Web Review and so on who are publishing information about the Net, but they're also sort of helping you find things on the Net. They're being guidebooks as well as just sources of information.

I'm going to skip a couple of these points and just go on to say that, unfortunately, I'm not yet ready to talk about what I think is the final answer to the question of how to make non-advertising-supported content work on the Net. But I do believe I have an answer based on my history in the Net, so I will simply tantalize you by saying that if you are a content publisher wondering how to sell content on the Net, live within the spirit of the Net and not have to rely on advertising, come give me your card and I'll contact you at some point in the hopefully not-too-distant future.

This is a complex industry, and I hope I've covered some of the points for you and some of the experiences we've had. We have about 10 minutes, I guess, for questions. Yes.

M: So, about pass-along problems. You've obviously had some problems with that?

Brad Templeton: Well, in terms of copyright? Yeah, a friend of mine, [John Perry Barlow], wrote an article which a lot of people have quoted in *Wired* magazine. He said, "Copyright is dead." And I got a mid-seven figure revenues. So it's not dead; I mean, the Net is there.

There are people who pass information along. One of the solutions we have to that problem is we don't sell articles, we believe we sell a newspaper. We don't want people to steal individual articles, because in the aggregate that affects us and hurts our business; but the truth of it is that the main thing we have to focus on from an enforcement standpoint is the theft of the entire newspaper and service. For someone who only wants to sell a single article, that's not a great answer.

Although, however, if you bundle yourself... That's actually a reason why everybody being a publisher with a shingle is a bad problem. A publisher can withstand a single piece of stuff being stolen; if the authors are all being compensated on the total revenues of the publisher, it actually works out pretty well.

The truth of it is that people actually — while they have a lot of disrespect for copyright, they're not wholesale about it. I mean, there are people who have no care about it, but by and large most people seem to know what it is and they're working within reason.

You know, sometimes there are some industries that are hurt pretty badly by copyright, and there are some things that need to change. But by and large it's not the problem that everyone has been saying so far.

M: How do you describe problems like the [inaudible] reader just put up a Web site, and now it's gone down and they changed the focus of it? And do you see magazines building themselves on the Web?

Brad Templeton: Well, magazines are an interesting question. One of the things that we discovered pretty early on in the news business was that yesterday's news was yesterday's news, and that reading on-line actually isn't preferred by most people to paper yet.

There are some people who absolutely just prefer on-line. If you look at my desk, you'll know what I prefer. There's just a mess of paper that I can't, I don't want to deal with. And I fire employees who give me paper, but the truth of it is that if it's weekly stuff or monthly stuff

people seem much less inclined to want to buy it on-line than wanting to get it on paper. So magazines, I think, have a harder road. As I don't know exactly why *Utne Reader* went up and down, as far as...

M: It seemed like it was two months and it was gone. Or the format they were going after was gone.

Brad Templeton: Did they give a reason?

M: They just said there was not enough interest. That was the only answer I heard back.

Brad Templeton: Yeah, I mean, in the case of *Omni* magazine, which made the big decision to go the other way, the sort of unspoken secret in the publishing industry was that the magazine was losing money, and when newsprint prices went up they said, "Can we make a nice PR spread as to why we're shutting this magazine down?" And so they said, 'Oh, we'll take it on-line, and we'll be bold and futuristic.' And — at least in the arm of the business that doesn't have naked women — they're probably going to be a success on-line.

Back there.

W: Your comment about micro-transactions, [inaudible] local phone service...

Brad Templeton: Yes.

W: But see, in Europe we pay everything. We get a flat fee and we pay for every minute you talk.

Brad Templeton: Do you like it?

W: No, but [inaudible] and the way in Europe where people are attached to this micro-transaction model...

Brad Templeton: I think it's going to impede the progress of the Net in Europe and in the other countries where people cannot get away from that model. It's true that the critical mass built in the United States and Canada and the other countries where flat-rate will help. People in Europe will adopt the Net just because they — because it got forced down their throats, rather than naturally, the way it was adopted in other places.

But we've had the ability to do measured-service networking for a long time; that's what the on-line services were in a way for many years, and that's what X.25 was. There were X.25 networks in the 70s, where you could go and make a connection to a wide variety of computers and then you could pay per packet to log-on to them, and it only got used for business use, where people really weren't looking the costs too much. Although, frankly, businesses do look at the cost, and businesses really love to know exactly what something is going to cost them, so they don't really like being billed by the hour either. They just pay it because they have no choice or because they're working on something where they must get what they're getting no matter what the cost, as long as it's within reason.

W: Yes, is the [inaudible] going to ask you about why you think the calls on the Internet are evil?

Brad Templeton: Oh, they're Satan. The reason that they're evil is exactly for the thing that I just described. The Net created a wonderful cost benefit breakthrough because of the idea of sharing a connection among a large number of people to do what I call "long-latency" transactions, where you don't care whether or not your packet gets there in a tenth of a second or a second, or in some cases a minute. You know, if you're sending a piece of e-mail you don't care if it takes a minute versus five seconds. And so you can have a data pipe, and a thousand people can share a 56 kilobyte data pipe and probably send all their e-mail with it, and because if there happens to be too much congestion for a little while we just delay this e-mail by five seconds, by ten seconds, and it's not — for Web pages, you're a little more eager for fast response, but by and large you can wait a tenth of a second versus a twentieth of a second, or versus a second, in order to get a Web page.

Well, voice isn't like that. Voice is "I must have that packet now." It has to get here within — if it doesn't get here within a certain amount of time it's no good, because it makes a disrupted and broken conversation. And there's already a highly competitive voice telecommunications business in the United States.

Now, you're right, over in Europe and in a number of other countries, there isn't a highly competitive voice telecommunications business. But this business — for stupid FCC regulatory rules — is already quite competitive and the prices are quite fair, and they're based on the idea that unlike a data pipe for mail and so on, the sharing is much more regulated. It takes about 13KB with compression of bandwidth in order to send audio along, and once you get enough conversations in it you don't get too much more sharing from taking the silence out. So if you want to have a hundred people share the pipe, you've got to have a hundred times bigger pipe.

So what they're trying to do is when they say, "Talk on the Internet for free," is they're trying to save money off an already highly competitive business, a business which has never managed to make flat-rate pricing work, partly because of the FCC regulations, but for other reasons as well.

And they'll drive the average usage up. When you have flat-rate usage like that, you have low volume users and high volume users, and they share the pipe and the price goes somewhere in the middle between those low and high volume users. If you start pushing everybody to use high volume just so they can save on their phone bills, well, they aren't going to save on their phone bills, the real cost is going to be translated into the average price that everyone pays. So those people who want a cheap phone call will end up making the price of all our Internet calls increase — or worse, they'll drive people to do per-packet charging on the Internet. which will change it from what made it what it is.

M: [inaudible] I was wondering what your thoughts were on those?

Brad Templeton: Well, the main focus of the talk was on publishing, and MOOs and MUDs. You could consider them publishing in a very abstract sense. But maybe the people, the MOOs and MUDs, are an addition, and I don't play them. No. I've heard sad stories about guys who get off trains at stops because they know there's a terminal there and they can play for five minutes until the next train comes. I mean, it's ridiculous. But it doesn't have a lot to do with publishing. I think they're a neat, interesting phenomenon, and they're an interesting type of interaction. But that's really a whole other panel, just about highly interactive technologies like that.

M: What would be an example instead of the [inaudible] successful?

Brad Templeton: Most of the on-line services. Genie is the one I'm most familiar with, but Prodigy to some extent, too. Remember Prodigy's initial business model, which was to be entirely flat-rate and provide all this stuff? The thing that killed it was they didn't realize that people wanted to do bulletin boards and e-mail. They thought everybody would just suck at the Prodigy teat, and they designed their whole network that way. So when suddenly everyone wanted to e-mail and do conferencing, and it all went back to the central network in New York, they found that they had too much load.

Genie and CompuServe, to some extent, ran into that. Genie decided to price their product with flat-rate for non-computing services and an hourly rate for computing based services, and it just started swamping their servers. The servers just went nuts. And they finally decided they just couldn't do this anymore because it's too successful, too successful in terms of what the customer wants. Unfortunately, not too successful in terms of the dollars.

We can take one more question. One there — well, geez, sorry, I saw him first.

M: Do you think the large [inaudible]?

Brad Templeton: Well, no. That's what the Net changes. I mean, the truth of it is, as I said, that people are not willing to just take random content shoved at them from all directions. They really are going to have people as a filter in between them and the information. But they'll have a lot more choice of that, I think. And the large content providers will discover that if they dissatisfy their customers, there are ways that the barrier to entry can be smaller for someone to come in and mention it.

The other thing about the Net that's really great is that if you do anger your customers — well, it's not great when I anger my customers — but in general, if someone angers their customers the customers have a feedback mechanism. The very thing that we're using to publish information to our customers is also a feedback mechanism, to make sure that our customers know what we're doing badly — and of course, so that our competitors know what we're doing badly, unfortunately.

All right. Well, thank you all for coming. And if you need to speak or find out more, I have a booth downstairs.

INTERNET FINANCE FINANCIAL SERVICES INDUSTRY ON THE INTERNET: OPPORTUNITIES FOR YOU



MODERATOR

Timothy Duncan
President, Duncan Resource Group, Inc.

SPEAKERS

Giles McNamee
Senior Vice President, First Albany Corporation
Jonathan M. Guerster
Director of Financial Services, Open Market, Inc.
Richard Moorman
Assistant Vice President, Electronic Commerce, Banc One
Mary Ruth Moran
Senior Vice President, Electronic Marketing, Fidelity Investments

Tim Duncan: I'm Tim Duncan and this is Financial Services on the Internet. Welcome to Internet World. There's a lot of folks here. We've got a couple hours here this morning, and we'll take a break after the second presentation and then we'll do questions at the end for all the presenters. We've got three tremendous, actually four tremendous companies represented here today, as well as mine. Fidelity, First Albany Corporation, Open Market and Banc One. They're all companies that have been very innovative and very progressive in using the Internet, and they're going to share some of their experience here today to hopefully help your companies move along in your efforts in the Internet.

I think that of all industries out there, with the possible exception of publishing, there's no other industry other than financial services that will be impacted quite so heavily by the Internet and interactive technologies. It's the largest service industry that exists. It's an industry that lives and breathes and dies on information, as I'm sure you all know. And it's a very competitive industry, as I'm sure you all know today too, that demands cost-effective delivery systems.

The Internet presents tremendous opportunities for financial service companies to reach clients directly in new ways that present enormous opportunities to develop in a completely new marketing channel, sometimes even to replace what before has been very expensive personal selling channels. And it also presents an opportunity to cut delivery costs significantly for financial service companies.

I don't know how many of you in the audience have had a chance to read Nicholas Negrepon's book, *Being Digital*. It's an interesting book at least if nothing else, and I would recommend anybody that's interested in the Internet, pick it up and take a look. One of the things he talks about quite a bit in the book is the wasted resources in the United States today, and all over the world today, on devoting the conversion of information, which is in electronic form or bits, to paper form or atoms. And I would say that if there is any industry that commits this wastage of resources more than any other, it's probably the financial services industry.

I think all of us, in whatever specific segment of the financial services industry we happen to be in, don't have a hard time thinking how much of computer-based information is translated into paper-based information and reconverted to bits at some point, based on some feedback, and then reconverted to paper information.

Even in that regard a lot is even discussed about security on the Internet today, which is important. But I think a lot of us overlook the fact that on our paper-based, hard transaction-

based systems today, check fraud and credit card fraud alone amount to over \$13 billion a year in the financial services industry.

So any of us who have been involved in the Internet in the financial services for any period of time realize that there's tremendous potential to use these new technologies to change our business and to deliver our services in a different way. And I think a lot of the time... The hardest time I have, as a matter of fact, is trying to figure out what areas that are really where we should spend our time because the potential is so enormous in so many different areas that it's almost mind boggling at times.

On the other hand, the last time I was at the World Trade Center for a show was 1990, and that was something called "DECWorld." And the hoopla was probably equivalent to this. And I remember the day after the show ended and picking up the *Boston Globe* and reading in the business section that DEC had announced their largest quarterly loss in the company's history, and one of the largest quarterly losses in United States corporations' histories, which I thought was sort of a bad timing for them after just having spent I don't know how many millions of dollars on "DECWorld."

The expectations of the Internet are going through the roof, and I don't think anybody can quite predict exactly what's going to happen despite the money that's being made now and by various people in making those predictions. The Internet is still too complex to use for most people. The numbers get bandied about that there's 20 million, 30 million, 40 million on the Internet, but as my mother used to say to my brother, "You know, finish your food. There's 40 million people starving in Africa." And he would say, "Name one." And I think if you get out of the Internet world, the folks like us that are in this thing everyday, and start asking people, "You know, do you use the Internet? What does it mean to you? How are you using it?" You'll find most people are still baffled and reluctant to even to look at it in many cases. So there's plenty of challenges that lie ahead.

Peter Drucker, the management guru, has said that for a new technology to supplant an existing system, the new technology has to be ten times more effective than the existing system for people to basically change the way they do things. People like to do things the way they're used to doing things. And I think that's really the challenge. We [can't] simply replace existing systems with this new technology, expecting that if we deliver equivalent services people will adapt to it. The services are going to have to be much better. And that's the idea today, to help you do that in your own, in your own companies.

We've got three segments of the industry represented; mutual funds, banks, and the investment banking industry. And we're all going to share a little bit of our experience and hope that it helps you.

First I get to do a bit of an infomercial on my company. It's called CorpFiNet. We're a site on the Internet that's devoted exclusively to commercial and corporate finance. Our idea has been first to build a directory, a comprehensive directory of reputable established companies that are on the Internet, where people can access services and products that they need through our directory. We have the hyperlinks obviously, and then we add some content to the hyperlinks. We're going to be soon publishing information and articles on the site with securities data. We're going to be publishing by mid-November, weekly IPOMNA activity around the world, lists of what transactions are being done, descriptions of those transactions, and then monthly and quarterly reports on investment banking and activity around the world. We're going to be publishing a series of articles and interviews on what's happening in the world of interactive technologies and finance. And then eventually we hope to be originating transactions through our site of different sorts, particularly in delivering different types of information.

The services that we offer are basically to help financial service companies use interactive technologies correctly and profitably. We do consulting and help with strategic partnerships for financial service firms. We do Web site creation and management. And we help people in the financial service industry start to learn how to deliver their products and services on-line.

In terms of philosophy in working with people, financial service companies that are considering using the Internet, we have a few ideas that I'll share with you.

The first is that despite the hoopla, there's going to be few revenue rewards from an Internet presence for the next year and a half to two years. If your revenue increased by 1% to 5% in the next two years, I would say you would be very lucky as a result of your Internet presence. People just aren't ready to buy. They aren't ready to spend money on the Internet, and we don't see that happening anytime soon, outside of spending for Internet-related products and services and technology.

It's important when you are thinking about what you're going to do on the Internet to start with a list of objectives. What do you want to do? Are there certain processes that you want to automate, put on-line? Do you want to try and generate new customers? Do you want to originate leads? Figure that out before you start spending money.

We believe people should start small. We feel that the initial expenditures on gaining an Internet presence will probably be dwarfed ultimately by what it's going to cost you to stay on-line and improve your site, and develop new areas in your Internet presence. We estimate that whatever you spend on your Internet presence initially, if it's X, you're probably going to spend 4X a year in maintaining that presence at least.

It's important to learn as you go and build on success. I don't think anybody knows exactly today how things are going to turn out. I think it's important to begin with a smaller site, a smaller presence, figure out what works and build on that success, rather than investing a lot of money in things that may not work. And it's going to be hard to acknowledge, once you've spent that money, that things may not work.

It's important to think information and not image. I think that there may be certain areas in the Internet and on-line services that do in fact, become a mass medium. But in financial services people aren't looking for entertainment; they're looking for information, and that should be where your focus is. To attract people to your site, to attract people to your services, you're going to have to deliver information.

And I think that what we're seeing a lot of the success in using the Internet is based on converting existing systems, simple existing systems, and converting them over to Internet technology, one step at a time. And as opposed to thinking about and trying to go out and gain new customers, it may be in many cases a better idea to focus on your existing customer base and what you offer them, and perhaps take some of those offerings and do them over the Internet in a better way.

To that end, I think First Albany Corporation has been a terrific example of that. Giles McNamee is the Senior Vice President with First Albany. First Albany is a highly respected investment banking and brokerage firm based in Boston. And they've done some very interesting things in terms of converting some of their research and information delivery systems to the Internet for their clients. Giles is a long-time Internet user. He's a Senior Vice President at First Albany, and his responsibilities include managing the institutional equity trading desk, and coordinating institutional equity sales and research. So here's Giles McNamee.

Giles McNamee: Do you mind if I close this?

Tim Duncan: No, that's fine.

Giles McNamee: The question is, will it work? Technology is such a wonderful thing.

I'm sure you're all aware of Microsoft's dramatic entrance into the on-line universe, Bill Gates' desire to further dominate our desktops. But we learned a little bit more about that at First Albany over the weekend. We upgraded our desktop operating systems over the weekend and when we arrived at work on Monday morning, we found the following message awaiting us: nothing. Yeah, we were surprised too. But the actual truth be told, you probably notice, I'm not smart enough to use DOS. I'm not smart enough to use Windows. I use a Macintosh. In fact, I've often been accused of being a Mac bigot.

Thank you. No, true story though. I'll tell you, last Thursday we affected an upgrade to our most critical proprietary Lotus Notes database, one which tracks our customer records, our customer contacts, and how we deliver research to our investor customers. And I was actually going out of town the day that the upgrade was going to happen, and I was talking to the VAR and I said, "You know, I need to take a copy of this with me on the road.

And the VAR said, "Well, how much space does the old copy take up on your drive?" And I said, "You know, 75 megabytes." This is a Notes app. There are no small Notes apps. And he said, "Well, the new one is 200 megabytes." So I'm thinking to myself, I don't have 200 megabytes of free space. A problem? No. An opportunity. I have a seven-month-old Powerbook 540c and I can toss it away and get a new PowerPC-driven 5300. I'm very excited about this. And so I'm reading through MacWeek to try to get a sense of what kind of different features I should order, so I think I'm going to wait a couple of months and see if they can sort the battery thing out and then come back and maybe buy one then.

Anyway, I'm not here to talk about Microsoft and Apple. I'm not here to talk about whether or not I need a new Powerbook. I'm here to talk about First Albany in cyberspace.

Just to give you a little background of who and what we are. First Albany is an investment firm which was founded in 1953. [We had] \$110 million in revenues at the end of our last fiscal year. We employ 650 people in thirty locations, and we are very aggressive users of technology. We've got an aggressive deployment of Lotus Notes, and if I showed you our VAR bills you'd be impressed at how foolish we were, that we should have talked to Tim Duncan first.

But you know, our data warehouse is now going through its second rev. We have an extensive internal Web. And so for those of you people who think that an internal Web is going to put Lotus Notes out of business, I would be glad to discuss this with you off-line. We run them both side by side. Then we try pretty much every new product we can get our hands on. We were an alpha and a beta site for AT&T's *Network Notes*, a product which may never get delivered, but we've actually been able to use quite effectively. We've been an alpha site for a product called *Wild Fire*, which is a follow-me roaming service that shows up at a lot of trade shows. It's pretty cool. We now currently are using Version 1.5. And we're beta testing, I think, four or five different software packages right now. And theoretically, as I signed the nondisclosures, I'm not supposed to tell you what they are.

Anyway, I am part of our institutional equity group. We are in the stocks business. We have sixty-five professionals in our group, located in five different cities; Boston, New York City, Stamford, Connecticut, scenic Albany in New York, as the name of our firm would imply, and lovely Burlingame, California.

Our primary focus is technology. My role at First Albany is that I'm responsible... I do three different things. I'm primarily responsible for a joint venture with Metagroup, which is a technology research and consulting firm located in Stamford, Connecticut. And with Meta we deliver user-oriented demand site information to sophisticated technology investors. Wall Street tends to look at companies and talk to the company management. We try to find out

what the people who are writing the checks are doing, which is sort of backwards. But we're from upstate New York, so that follows. I'm also responsible for all the interaction with technology investors, which is the fun part of the job. And the sweet part is that I'm responsible for our technical, internal technology deployment, so I get to get my hands dirty, and I get to learn about all kinds of new gadgets and toys.

You know, [given] the nature of our business, and having five locations, we are active practitioners of the virtual office. We use Lotus Notes, as I said, because it have a very robust feature set, and it's got an excellent remote access capability. Obviously, we use a lot of laptops. We have a very advanced telecommunication systems internally, so that all of our offices appear to be linked up with each other on open microphone lines all the time. We use, as I said, *Wild Fire*, which allows people to be, have one telephone number and have that phone number follow them everywhere they go. And I took my pager off so that it wouldn't go off while I was standing here and embarrass me. But we obviously have to use pagers and cell phones all the time.

We are in the information business. And what that means is we do research. There are a couple kinds of research. We do traditional investment research, which is, you know, "Buy this stock. We think it's going to go up." And as I said, we're in a joint venture with Meta to talk, which is a process where we talk about technologies and trends, and what people are really doing. You know, people who are writing the checks. Institutional investors pay us for providing them with value-added insight. If we know what we're talking about, we do thorough work, we will get paid.

And so our goal is to understand industries and the companies, do thorough research, and that also in turn will lead to investment banking opportunities for us. At least, our finance people hope.

But we, as I'm sure you all know, are in a very highly competitive business. We have lots of competitors. They're all bigger than we are. They all went to Harvard so they're smarter than we are. And you know, there's an awful lot of information available to institutional investors.

You know, they have access to the most sophisticated systems, and we have to compete with that. So to compete we need to provide quality. We need to be accurate. We need to be [able to] provide the information in a very timely manner. We need to be providing information of a different nature than our competitors so that it stands out. It's something different than the twenty-six other reports about Netscape that they've already seen. And we want, and we need to deliver this in a very user-friendly manner so that they like getting it so that it's not another problem.

So what makes us different? I think the most important thing is that we're users of technology, and we encourage all of the people in our group to personally interact with all the stuff they do and use the systems. Because if you use the stuff, you get to know it a lot better.

As you know, if you look at the price of some Internet-related securities, it's quite clear that none of the people who own those stocks has ever actually been on-line. When you get the little message that says, "No DNS entry," and they drop the line on you, maybe you wouldn't pay so much, you wouldn't pay two thousand times their earnings — if they had any. But like I said, I didn't go to Harvard so I'm not smart enough. No, seriously, Wall Street talks a lot of about technology, but the incompatibilities of the real world often escape people, and if you're not trying to actually plug them in yourself you sometimes don't know that they don't work together.

As I said, also what makes us different is that we try to focus beyond the technologies and the products that are succeeding, that people are actually buying, that are actually in corporate budgets, which is different than the normal spin. And as a consequence, we do an

awful lot of work on private companies, because certainly in software, and especially in the Internet, a lot of the people who are doing really exciting things are small private companies.

So that brings us to the on-line world. So what do we actually use the Internet for? Wall Street has always employed a lot of technology. As Tim mentioned, it's an information intensive business. People have quote systems. They get all kinds of news. There are transactional services available. You can even do on-line trades, on a closed system called InstaNet. The New York Stock Exchange has all kinds of links as well. There are order indication systems like [Autex] and Bridge. There's obviously also much publicized computer-based trading. These are all closed systems. They're all very proprietary. They all require specific LAN lines, point-to-point.

We see the Internet as an opportunity to improve, improve the ways we communicate with our customers. To us, the Internet's all about communication. We're in the information business, so communication is what we do for a living.

The Web particularly offers tremendous opportunities we think, to present very much in-depth information in a graphically friendly manner, not the sort of ASCII 10-point Geneva that's normally sort of — it used to swing around the Internet, but actually having it show up the way, more or less the way you want it to look. You know, I don't know if you... I'm sure you've all surfed around a lot and you see corporate Home Pages, and a lot of people's corporate home sites are sort of one-time-only visit situations where you look and see a little information on the company, isn't that nice. You know, we think that there is a lot more to be done, especially being in an information business. We think we can deliver the work that we're already doing in a very usable, user-friendly manner to our existing clients, and that people would have an opportunity to work with it.

And my screen-saver went off.

So the four basic things we do on the Internet: We communicate, we trade, we gather information, and we disseminate information.

First, communication. Very simply, that's what the Internet's historically always been about. It's a message system, point-to-point. Our investors' most precious asset is time. They have plenty of money — that is what they have. Time is what they don't have. And they have lots of people just like me trying to command their attention. They get inundated with mail and faxes. They get boxes and boxes of mail every day. And you can call them on their voicemail, and it's a one-way street. We find that e-mail actually works [for] talking to them. It crosses time zones. I personally interact regularly with investors in both the United Kingdom and in California, and if you're not in the right, if you don't call them at the right minute of the day, you might miss them, but e-mail always gets them, they respond to it. It can be stored and retrieved. You can actually say what you meant to say, as opposed to garbling what you meant to say when the voicemail message cut you off halfway through. And as I said, we always get a reply.

We have been trading on the Internet for quite a few years. There's an organization in Boston called Batterymarch Financial, which has been a computerized investment firm for fifteen years, I think. They've been trading on the Internet for more than ten years with brokers. When we first started trading with Batterymarch, they had a Telnet system on the Internet which you communicated with them at 300 baud. Happily, they're much more state-of-the-art now so you can actually deliver the packets and stuff relatively quickly.

Also, a lot of the closed-end systems that used to exist, like Autex and Bridge for indicating interest in buying or selling on a stock, have moved into open systems on the Internet — or open in a relative sense, obviously with a certain amount of security as well.

Fidelity has been a pioneer in this. They pioneered a system called FIX, F-I-X, Financial Information Exchange, which allows brokerage firms to send indications of buy or sell interest

directly to trade, from a specific trader to another specific trader, point-to-point. You know, I want to buy 100,000 shares of Apple, and literally you can point-to-point, you can send that directly to an individual or to a group. It's pretty cool.

And lastly, we trade by the old messaging system like e-mail on pages. I know that sort of sounds silly, but investors tend to spend a lot of time not at their desks. They travel a lot. They go to a lot of trade shows. They go to a lot of conferences just like this. You know, they go out and see their companies. They kick their tires. How do you get them? Well, you can send them e-mail because that will find them anywhere. It doesn't matter what hotel room they're in or wherever, they'll respond to that. Or we have a Skytel pager, an Internet pager gateway, and we can send e-mail directly to people's pagers, which I personally did at a trade last week. I hit them on their pager, and the person was at a conference someplace in Arizona, called back, and bought. So it does work.

We use the Internet for information gathering. It's a tremendous resource for this. Our corporate finance guys use Edgar and the other federal repositories for getting company information and demographic information and the like. Research analysts use the Internet to do company research and product research. They regularly visit company Web sites. They look at the product forums to see what people are saying about the companies and stuff, and what they're saying about the products. We get user feedback.

It's one thing to go to a company's Web site and see their most recent press release on a product, but it's another thing to go into an AOL or a CompuServe forum and find out what real-world problems the user is having trying to install the same product that was so much heralded in the press announcement. And that's the real world. That you can find the stuff out there, it's out there, it's great.

And lastly, we do find all kinds of great presentation materials. Some of the things that I used earlier and this little item which I found the other day are all available on the Internet.

But the most important thing, because we're in the information business, is disseminating information. As I said, we use *Notes* and *AT&T Network Notes*. We have dial-in access for investors into *Notes*. We like this because the applications are very robust and they can search and sort them and play with them in lots of different ways. They deliver PDF files and have for quite a while, and it works pretty well. So you can not only look at things but you can also download them and take out different bits and so on. That alone has saved us a great deal of money and probably more money than we've spent on all of our Internet products and projects put together.

We used to do a lot of printing, both for internal and external use, and we had an entire printing operation, printing presses and all kinds of little guys that did printing. And that's all gone away, because it happens electronically. We've saved on the mailing costs. It's been tremendous. We also find that e-mail complements fax and paper mail. You can send stuff to people, and investors get stacks and stacks of mail. But if you send them e-mail, the same research report, they'll actually see it and read it, and they'll respond, they'll send you a little message back.

And lastly — and I think most importantly, because this is where we spend a lot of time and energy — is the WorldWide Web. We think this is where the biggest single opportunity lies with us, because this gives us the best point-to-point opportunity. You know, a lot of people don't have *Notes* on the desktop just because an opportunity to pretty much access every single one of our customers.

And to [inaudible], we built a couple of Web sites, and [I'll] talk to you first about the background of how we went about it. First, the corporate Web site, which is more general.

The goals of this were to provide information about the firm, who we are, who our people are, what they do, some stuff out of our annual report. First Albany is a public company,

so stock is publicly traded on NASDAQ, so there's some information about that kind of stuff. There's samples of our various kinds of products, and the firm as a whole has municipal bond deals that we might be working on, financial services products and the like. And it was very important that we have some interactive feature to it so that people could respond, and there's different ways that they can send us messages and say they're interested in things, and that provides leads for our retail salesmen to follow up on.

This is pretty much a standard corporate Web site, without really significantly robust goals. However, in our group we tried something a little more aggressive. We looked at some of the Web sites built by our competitors. The graphics on Morgan Stanley's Web site are tremendous, but it's pretty much their annual report. And [Volpe-Welty] also has a beautiful Web site, but I don't think they've updated it in a couple of months. It's difficult in maintaining a Web site. So we had a few goals that we wanted to affect when we built this thing.

We want to be able to provide controlled access to all of our published materials, both in text form so they could see it on the screen and play with it, and also so they could download it in its original form with all the fonts and all of the graphics and the tables and the graphs and charts, and all of that kind of good stuff.

It had to be user-friendly. I mean it had to be a no-brainer, a couple of points, not ten, not a lot of steps involved.

The information had to be up-to-date, and it had to be regularly refreshed. We needed to have full-text search capability so that people could go in — and the volume of stuff we put together is a lot — and know what to look for, and if you've got full-text search you can find whatever it is. At least that helps a little bit.

We needed it to be secure. I mean, obviously security is a huge issue these days. It will always be an issue. You know, certainly our chief financial officer, our trading desks are a little bit concerned, anytime anybody is dialing into our firm, that these people may have access to what we're doing. So [there are] a lot of issues about firewalls.

And lastly, I thought the most important thing was that this should not be MIS intensive. We wanted to build something that was fire and forget — just set it up and it was going to work, and you weren't going to have to do anything to it more or less after the fact. And that is a real challenge if you want it to also be up-to-date.

So what were our solutions? We used a product from Lotus called *Internotes*, which translates our *Notes* databases into HTML. This allows for regular replication, so all the stuff that's live that we're using within our virtual office is live on the Web.

This also allows for the transport of PDF files. This has been a slight issue with our firewall, and I'll get to that in a second. Some days it works better than others, but it will over time provide all of the robust features, or most of them, that are currently available from AT&T *Network Notes*.

You know, we had to build a very elaborate series of firewalls, both software and hardware, to protect what was inside the firm from outside, and it seems to be working. I'm sure that's not a challenge. I don't want anybody to try to break in. If you do however, I would appreciate you just dropping me a line and letting me know so that we can fix it. We use *Netscape*, a *Netscape* server. It allows double password protection, and that's got an additional benefit in that we can see who's using the system. We can see what they care about. We can see, after we've seen who's been in, we can see what the hits are and what they're looking at, so we can do follow-up and we can do additional work with them if necessary.

There were, of course, some problems. There are still some problems. The most important thing to remember about the Internet is that everything available for the Internet is enormously immature. It may be a great idea, great software, but it doesn't always work so well.

We experienced a lot of competition for MIS resources, and I think everybody is going to have that problem. In the client/server world you just don't have enough bodies to do all the MIS work you need to do.

The security firewall issues have been a big deal — getting the packets outside the firewall of information in the replication cycle, but keeping the replication process intact and letting people in, is a real issue.

We've had a lot of operating system conflicts and software conflicts. *Internotes* runs on NT. Our internal *Notes* servers run on OS/2. We run UNIX, Mac and PC internally. And there are a lot of these things. I mean, the biggest deal, the biggest thing is that it's all easy to use, it's all easy to set up, but it doesn't always work well together; and it doesn't matter what they tell you downstairs — or excuse me, across the hall — it's not always quite as easy as it sounds. Sure it takes two hours to install each different product; it's the three weeks to get them to work together which is sometimes more complicated.

Also, what turned out to be much more difficult than we originally envisioned [was] the full-text search thing, [which] is not quite as simple. We are still working on that problem, that part of the process. Actually I hope to have that fixed either today or tomorrow.

So what are the results? We have two Web sites. Feel free to take a look. The first one is the corporate Web site. The second one you can't get into, unless you get a password — unless, of course, you are good at that kind of stuff in which case, as I said earlier, please send me an e-mail and let me know how you did it.

So what did we learn? We learned a bunch of things. It would have been faster and cheaper to outsource. Much cheaper. And it would have taken a tenth of the time. But if you outsource it you don't have the fun experience of being able to learn how to do this, and then I get to tell you what a great, great time we had doing this. So that's worthwhile.

You know, the security issue is complicated and it will get increasingly complicated. Everybody's client/server world looks different than everybody else's. Everybody's network is different. The issues are always more complicated than the vendors will tell you. And it is both a hardware and a software solution, and I would suggest that you don't let anybody try to tell you otherwise. As I said before, Internet software is tremendously immature. You know, the stuff's all in its first rev, or its second rev, and there a lot of problems. There are a lot of bugs. Things go down for no reason, but that's life on the Web. And as I said before, the products are easy to install; it's making them work together which is really complicated.

But I'll tell you, the thing that stands out about all of this is I have absolutely no idea why Netscape is worth three-and-a-half billion dollars. I mean, IBM paid three-and-a-half billion dollars for Lotus. I don't know if that was a good buy either. I have absolutely no idea. But I do know that the future is very important. And we are really excited about being on the Internet. We're an information-based business. We are a natural for the Net. This is what our business is all about. You know, every time we find a new way to communicate with our clients it gives us a new opportunity to do business, and we're going to take advantage of every opportunity that there is out there. The Internet, compared to all the other things we do, is cheap — and it's an easy way to get point-to-point, directly to people we know who care about stuff we're doing, our existing clients. And all I can say is we're really excited about the future. This is going to be a really big year for us.

Anyway, thank you very much.

Tim Duncan: Open Market is based, along with I think eighty other Internet-oriented companies, in Cambridge, Massachusetts. And in my opinion it is really one of the truly exciting companies out there doing things with regard to the Internet. And not only that, I think they've managed to distinguish themselves tremendously by being about the only company out there in

the United States that's doing Internet-related businesses that's making money, and hasn't gone public yet. They are highly focused. They've combined a brain trust of very intelligent MIT [people] and folks from other places with a technology background with people that have a business understanding of specific vertical markets such as publishing and finance. They're delivering products, software products and solution products to those specific industries, and I think are going to be really one of the top stories that come out of all of this in a year or two. I mean they are already.

John Guerster is going to present today with Dick Moorman. Dick is with Banc One. He's responsible for the sale of electronic commerce and interactive EDI programs for Banc One. And John is responsible for financial services. He's the Director of Financial Services at Open Market. And they're going to focus on the solutions they're providing for Banc One in terms of business-to-business products.

John Guerster: Good morning. Can you hear me back there? Just a thought following on the last presentation. I was talking to a friend who worked at Cal, and who's a young, eager salesperson, and he was talking to some institutional clients and they were picking on him pretty hard because they wanted an earnings story for all the issues he was trying to sell to them. And I was actually at a pub in London with him about a month ago. And he said, "This Internet thing is really ticking me off." And I said, "Why?" And he said, "You know, all this time I learned about earnings and I go back to these guys and push earnings, and this IPO from this company called Netscape comes out and I call up my investor and he's totally angry with me because I haven't called him. I said, 'But you wanted to talk earnings.' He goes, 'Yeah, but this is the Internet.'"

And I appreciate some commentaries on this segment and how exciting it is, but it is true that it's an emerging industry, and one of the things that Dick and I would highlight is that there are some things that are being done right now, today. And one of the things we learned at Open Market is that there is no textbook, so much of what we think we're getting is learning. And that's going to drive what's going to happen over the coming months certainly. So with that, I will try to manipulate this system.

[Tape change]

John Guerster: Okay. What we thought we'd do is just go through a bit of background on Banc One and Open Market, then go into a little bit about how we view the market. Actually, this will be a little bit of Open Market's perspective on what we're learning from financial services institutions about what they think when they look at the Web and the Internet and how it can change their business model. Then we'll go into the business-to-business segment. There's been a lot of hype about the consumer to business segment; we thought we'd focus on the business to business segment. And then we'll go through a case study as to what we're doing with Banc One. We're going to sort of pass back and forth, but please feel free to jump in and ask questions if you think it's appropriate.

And lastly, we'll finish with some summary and observations.

A bit about Open Market and then I'll let Dick certainly talk about Banc One. We are here in Cambridge, and we've been growing very quickly. For those of you who saw the article in the *Boston Globe* this weekend, much of it was true, actually. One of the challenges in the PR space in the Internet and the Web is that very rarely is the article totally catching what's going on. And we joke about it. And so when we see an article that's true, we're a bit surprised. But in general, it suggested that we're growing very quickly. We're now at a 180 people.

We actually have a development site now on the West Coast, and we have some great folks from Xerox PARC we've hired. They're doing some R&D for us, as well as some development engineers. And Greylock Venture Capital here in Boston was one of the venture capital firms in on our organization, beginning of last year. And since then, we brought in financing from Time Tribune and Adventist Publications.

Dick.

Dick Moorman: It's always interesting when you try to describe the positioning of commercial banks today in the marketplace. What I can tell you is that Banc One has approximately \$90 billion in assets as of the end of the third quarter. I haven't checked this morning's headlines, so I think we're still one of the top ten banks in North America, but we never know for sure. It's a moving target.

In terms of capital measure, which we are very proud of — we are one of the forty largest banks in the world in that regard. We are a well capitalized financial institution. We operate in thirteen states with banking charters. We have other non-bank subsidiaries that practically take us throughout the U.S. and other parts of the world, and we have roughly 45,000 employees looking very closely at things that Jonathan and I are talking about.

John Guerster: I thought it was worthwhile just to give you a picture of the segment as we view it. Again, one of the challenges in the public positioning of what's going on in Internet and Web is to understand what each company is doing, because very often there's a three-person firm suggesting that they're doing everything on the Web, and it always catches us a bit by surprise. And then there are these large organizations who put together partnerships. And much of the challenge right now is understanding what specifically will be delivered from these organizations and trying to plan it into your future. That's a bit of what we spend our time on.

I guess I'll use one of the terms we used very early on with our company, which is that we tend to think of ourselves like plumbers. If you can think of the Internet as a big open network without an infrastructure, what we're trying to do is essentially put the plumbing underneath. And the way we look at it is from a segmentation point of view, that there's been some publicity around, companies like UUNet for instance, going public, raising capital to build an infrastructure to allow people to get access to the Internet. And certainly our friends from Netscape and Spyglass are in the space of making Web browsers and Web servers, and they raise capital in order to push their model forward aggressively in the next several years.

We tend to operate from the Web server and go back. And essentially that's the focus of our company, this quote-unquote plumbing model if you will. And there's a bunch of issues in there. In fact, one of the biggest certainly is security, and that's worthy of an entire day-long discussion.

I will mention to you one thing. Actually, yesterday I present in San Francisco at another conference on electronic commerce, with a guy named [Guidas Barducas] from Microsoft, the STT Product Manager. We were both presenting and we were commenting before the session that we've been giving the same presentation on security for quite some time, but they had presented us from VISA, from MasterCard, from Microsoft — certainly Open Market was included — and what we found was that we're getting to the point where everyone is saying the same thing. And that's an important message, because security is a large topic. What it suggests is that there's some market dynamics happening here where people are looking at the same issues — and we can go through those off-line — but in general it was interesting that it's taken about six to nine months, six to nine Web months, as we call them, for the market to get up to speed on the general principles and what's necessary in the area of security.

On the left is a bit of a view on how we think most financial services firms have traditionally looked at this sort of model. It's a new segment, and most people come to us with the idea, at first, that it's a transaction model. It allows them somehow as a bank or a financial services firm to drive transactions, because that is the core business they're in. And certainly they think of it as a mass market or a delivery channel model. One of the things they're less clear about is whether it's a content or a services game, and I'll go into that a bit later on. In the publishing space, many publishers who have content that's interesting are thinking about providing transactions at the back-end so they could be in two segments.

On the right, is actually Open Market's view of what we think financial services firms — and probably most industries who are looking to segment — should think about, should focus on in any business model they'll explore for the Internet or the Web.

And the first one on the right is probably the most important, and that is relationships. I'll go through an example about what I think is happening there, just after I go through the rest of the points.

The ability to generate new, differentiated products is the opposite of a delivery channel, actually. Delivery channel suggests you have a product and you push it on the channel; what the Web and Internet should be focused on and be used for is developing a completely customized product.

And that speaks to the third point, which is that you arguably could look at a model where every customer has their personal on-line service, and this can be done for almost nothing or for very little incremental costs. That's a very different way of thinking about this.

And lastly is brand. I'll use the example of Time, Inc. How many of you have been on the *Pathfinder* service? Okay. *Pathfinder* actually is running on all of Open Market's infrastructure. One of the things they came to us very early on with is that they wanted to build this new service. Now, what's interesting if you think about Time is that it has incredible brand awareness. The brand awareness, however, is associated with *Time* magazine, *Money*, *Sports Illustrated*, those sorts of publications, the physical magazine you pick up at the airport before you jump on a plane. And what Time said was, "Listen. This is such a different paradigm. What we need to do is think about establishing an entirely new brand. And that brand should not be associate purely with the content game we've been in until now, because what we want to do is electronic commerce. We want to have a complete on-line service." And so they took a huge step.

For a consumer-oriented company like Time that was a major statement to make. You have to think through what the thought process was. But what they were saying was, "This is a new game, and *Pathfinder* is the name we're going to stick on this "thing." And I can tell you, having worked closely with them as an organization, we've learned a lot with them over the last several months. They get millions of hits a day. They have hundreds of thousands of users. And what they're doing is they're learning. But the important message to take away is that they chose to establish an entirely new brand for this paradigm, not leveraging what the word Time stood for already but establishing something new. And I think that will have significant value going forward.

Numbers. Let's see. I talk about Web months, and a Web month is when... About five times as many things happen in a Web month, so this is all of about five or six Web months ago.

People were pretty excited to get hard data on the Internet and the Web. I just grabbed this bit of data from a recent Alex Brown report that came out on the Web; and I speak less to the numbers, the revenues there, but more to the trend. And so what's happening now, if you saw even some of the press yesterday, is that CommerceNet and Nielsen came out with a report, the first credible report on Internet users. [There are] some demographics, some user

trends, and certainly a fair number of research firms are looking at establishing the back part of that.

One reason is to understand the consumers, and the other is to understand what businesses are doing. And both of those bits of data are now becoming available. I can't ascertain whether those are credible or not; what I can tell you is that a lot of those institutions are asking firms like ourselves to give them some hard data.

And I'll tell you, I'm doing my business plan for next year, and I have no idea how to forecast this thing. Don't take that back to my boss, but I have to give them some ideas because much of this market is built around resource planning. And you've got to be able to handle a certain opportunity.

Well, with that said, I'll actually hand-off to Dick to cover a bit of what we've learned in focusing on this segment for this latest opportunity.

Dick Moorman: What we have tried to do is identify in the business-to-business community where opportunities exist. A lot of the newspaper hype and all the publication hype has been more on the consumer-to-corporate side, and where are some of the fancy things going on electronically; as corporations begin to go through — and have gone through in the last several years — a whole re-engineering process, they're looking for ways to reduce and cut costs on the administrative side.

One way they have chosen is to obviously look at how they do corporate-to-corporate communication and contact. The typical way is through the standard EDI, electronic data interchange programs, which have been pretty much driven by various value and networks that are already in place. Fine. That's no problem, except that there is a cost-related issue there. What we're beginning to see are businesses looking for alternative ways to keep the electronic peace, explode into more than just typical business-to-business information, and get away from using proprietary networks and try to go to as much of an open network potential as possible.

Information capture, as Alex said earlier and others have said, is the key to a lot of what we're looking at here. It isn't even just from a banking perspective, it is not just funds movement — it's all the information related to it, which will become an integral part of all this.

And then, ultimately, customer service. I shouldn't say ultimately, but related to it will be customer service, and how in fact you can complete the window or the model of the entire electronic commerce process.

John Guerster: Go next?

Dick Moorman: Yeah.

John Guerster: I did it.

Dick Moorman: I think, as you look at the business-to-business aspects of electronic commerce, that it changes a little bit the perspectives that various parties bring to the table. In the traditional environment the bank will go in and talk to the corporate treasury department, work out what needs to be done and the business is completed, and the contract may be signed. When you start to elevate this to the level of electronics and get away from some of the financial aspects of it you begin to change the terms in which the various parties do business.

In Banc One's case, we've looked at where we have strengths and where we need to strategically partner with other organizations to bring together a package of services to the business community, and that works well whether you have an existing relationship or not. If an existing relationship already exists, what is necessary is to get beyond where the traditional

relationship resides. Typically that is in the treasury and in the finance area; and we have found, quite frankly, that over the last few years where we have scored successes in the whole EDI marketplace has been getting past the financial area. Incorporate them into the process, but get to the owners of the process. If it's a purchasing application, if it's something that affects payables or receivables, get to those folks if you can and spend some time talking about what makes their job difficult today and what can be done to improve that and change it.

John Guerster: Actually, if I could add something there... In a prior life I worked for Hewlett-Packard in the hardware space, and one of the challenges for any of the sales reps in the field trying to get to a model of actually being able to sell their hardware was to get to the decision-maker. Typically, it was some sort of person in the IT space. My first day at Open Market there was a CEO in a back room, one that had no air conditioning, and he was there with a whiteboard sketching out what his business model was going to be.

And what it speaks to — and certainly the things we've learned — is that the people who are looking at this are the business side of the institution. And it's a very interesting model. Actually, the comments that were made earlier spoke to it, the fact is that business people are making decisions on this space. It is new, and so to the extent you can get to the business folks, they're going to understand the metrics and the way that they can expand the business model and drive that as a process in the organization.

Dick Moorman: It's typically a group decision, but generally speaking we have found that if you can get to the owners of the process then they drive the process upwards, back up to the ultimate decision-makers, and it makes for a much smoother process.

But when you talk about organizational challenge, the real key is that oftentimes the people you are talking to are going to be directly affected by the change that occurs. And it takes an awful lot of hard work in getting folks to work together in unity to figure out what the best bet is going to be here. There will be some changes, obviously. If through this process we can eliminate a lot of the administrative paperwork behind the purchasing application, or the processing of an accounts receivable application, the focus then is how resources can be productively employed, because they won't need to be productively employed in that particular process. So it provides for some interesting discussions as you get deeper into it.

And I guess, as far as the significant drivers of business transactions, I'd say it's almost more the amount and type of information that really tends to get the focus. Cost is certainly a factor, but quantity, large quantities of transactions will often drive the process and the decision-making process to change to another process.

That's kind of a general overview. Jonathan, did you have anything more to add to that?

John Guerster: No.

Dick Moorman: That's kind of a general overview. Looking at the next slide we have up, we thought we would walk you through a little bit of a specific business application that is currently up. It uses the Internet and involves large groups of buyers and large groups of sellers with a common need.

We spent some time over the last nine to twelve months working with a company called [Rowe Communications], which is also located here in the Boston area. That company basically is in the business of providing subscription agency services to link technical, scientific and medical research libraries to the publication industry that provides the serials and periodicals on an annual or more frequent basis.

That whole industry has very typically been labor-intensive, very much paper-driven in the past. A major library can order thousands of periodicals on an annual basis. It was all done through issuing paper purchase orders to the subscription agents, who then would take and consolidate those and send massive quantities of paper to publishers, along with a check or two checks representing the full amount of the payment. It was a long purchasing cycle. The order could be entered today, and it might be six to nine months before the actual publication appears, because the ordering occurs one time a year. Delivery occurs throughout the year. The third party in the process was taking a cut of the business, and therefore everybody was participating. The backlog, I think, was a major part of this, in that we had the long lead times and it was very difficult in the case of customer inquiries and customer service in the traditional marketplace to know where things stood.

What we were able to do, working with Rowe and with Open Market, is partner together into a program that allowed for the delivery of information at the library side, the electronic catalog of all the major publications available produced by the major publishers worldwide — available on PC and on software — that the library could then go through and in one move electronically enter purchase orders for all of their publications for the next year.

We'll go through the flow in just a second. The actual movement would occur electronically. Most libraries and most publishers are already communicating on the Internet, so there was already a comfort level of how do we use this animal here we call the Internet. This allowed the link-up to occur and ultimately, in addition to the link-up, we were able to move all of the funds electronically from the library's accounts through a system into the publisher's accounts.

And ultimately we see this becoming a worldwide program right now. Most of what we're doing is domestic; the next step is to incorporate full electronic capabilities in the payment side worldwide.

As you look at that next slide, you can basically see the parties are fairly few here, and the movement of funds occurs, as I just described, along with the communication, between the libraries and publishers. And it gives access, where before it was not available, for publishers and libraries to communicate directly with others and with each other. So it really opened up the communication links completely.

What we found to be valuable about this from a financial servicing standpoint is that it allowed us as a bank to get closer to two marketplaces that we've always felt would be good markets to explore. And that's the university library market, if you will, as well as the publishing industry. This provides that kind of an opportunity. It allows both sides of the equation, both the buyers and the sellers, to dramatically improve their own internal operations, and we've heard some ballpark numbers now that are fairly substantial in terms of cost savings from the standpoint of the library's side.

John Guerster: There's some interesting market dynamics going on here as well, because it just so happens that libraries happen to be typically connected to the Internet, and publishers are pretty interested in the Internet and the Web because they see it as a distribution vehicle. In this case, the way we've architected the solution, they're capturing their order information through the Internet as well.

Dick Moorman: Right.

John Guerster: But those are some good models of some trends that are happening that make this model very successful in the short term.

Dick Moorman: We have been in a test mode for a few months, and we're actually moving into a live mode right now. And we're very pleased with the results. But you can see here the implications of this particular application; we found a way to deliver a traditional product at a much lower cost, substantially lower than previously. It's instantaneous information and movement of funds. The business model, really, is interesting. We not only have authentication, we have reporting and the movement of financial transactions. Everything is done electronically.

Jonathan can speak a little bit more to security in this area. What we see really is a model that allows us to determine where there are other markets like this, with large quantities of buyers and large quantities of sellers with this common need throughout, as a model to bring to the table.

John Guerster: One of the wonderful things about the Web is that it lets you do anything. And one of the terrible things about the Web is that it lets you do anything.

Dick Moorman: Right.

John Guerster: So the challenge in this sort of model is defining what exactly you want to do. And certainly the way that Open Market looks at it is that fundamentally there are three things going on in any business process: there's authentication of the individual using this environment; there's reporting, integrated reporting going to the bank or to the customer or to the merchant who's selling the product; and then there's the financial component at the back-end, be it a credit card, or be it an ACH in this instance.

And if you look at those three things, and address those three things, you have addressed any fundamental business problem. The challenge is to define what exactly are you trying to do on the front end. In this case, it's libraries and publishers; but as you can expect there are plenty of situations where there is this intermediary, and there's a process of disintermediation going on, and looking at should this intermediary continue to play a role between two parties.

Okay. In summarizing it, actually, I will just speak to a second and third point; I think the first point will be discussed out there on the trade show floor. The Internet should sell itself to most people.

But there's two things going on in the second point. One of the challenges right now for people looking at projects in the space of the Internet and the Web is to justify it on an overall basis, not on an R&D basis. A business-to-business sort of model allows you to do that, because you have transactions to the back-end, and you can build a business case much more effectively than you can trying to judge the effectiveness of an advertising model using a Web site, for instance, from a consumer point of view.

And the second thing I would emphasize is that in this market there's a substantial premium for early entry. And what that speaks to is the fact that if you look at someone like Time, for instance, to the extent that *Pathfinder* delivers you a valuable service and continues to upgrade it and add more value, the odds are you won't switch to another service that comes up and it competes against it. They've gotten out there early and they're locked you in as a customer, and that's very true for all the different segments we're looking at in each case. To the extent you can lock in an early relationship with someone, you stand the benefit of being able to continue to drive that relationship going forward.

Thank you very much for your attention.

Tim Duncan: I estimate that we have 320 people in the room and we have coffee service for 8 people outside. We're running a little bit behind time, and what I'd like to do — we're never going to get everybody out and everybody back in.

Mary Ruth from Fidelity is going to talk. If we could take just maybe five minutes, and if we could just stretch where we are, a couple of people have to leave the room. That's fine. And we'll pick it back up in five minutes. We'll have the Fidelity presentation and then we'll have questions.

[Break]

Tim Duncan: Let me introduce you.

Mary Ruth Moran: Okay.

Tim Duncan: Okay. I think we're going to get going. If you could take your seats, please.

Mary Ruth Moran: Yeah, I think we're all set.

Tim Duncan: There's been a lot of hoopla about Microsoft that we've all heard over the last five years. But I think that right up there with Microsoft in terms of corporate success stories in the last decade — you would have to rank Fidelity right up there. Certainly in the financial services industry, there's been no greater success story than Fidelity. They're the largest mutual fund in the country. And I think most importantly, I heard Steve Case say a month or so back when somebody was delving into all sorts of technology issues, he said, "Look. This isn't about technology. It's not about technology at all. It's about getting people what they want."

Tim Duncan: And I think that's something to remember, particularly in the financial services industry. I think that's something that Fidelity has really taken to heart over the last years, ten years, in getting to where it is today. They've used technology very effectively, but you wouldn't know it because their focus is basically on getting people what they want, and that's why they've been so successful. I think this is also true in their accomplishments on the Internet so far. I think anybody that's seen their site on the Internet and what they've done is going to be very impressed.

Mary Ruth Moran is the Senior Vice President at Fidelity. She's responsible for the company's WorldWide Web and Internet strategy, and also responsible for the electronic distribution channel as a whole. She's a graduate of Wellesley College and Harvard Business School, and she's going to talk today about what Fidelity's done so far, their successes and what they've learned.

Mary Ruth Moran: Thanks. Good morning, and Happy Halloween to all of you.

Has anyone here in the room ever been to the Ed Sullivan Theater to see the David Letterman show? Yes, so this room is about as cold as Dave keeps his studio. But we'll try to keep everybody awake and get you out of here on time.

As Tim mentioned, I'm from Fidelity Investments. And the comparison to Microsoft is flattering, I think. I want to tell you a little bit, give you a little bit of a behind-the-scenes look at our experience with the WorldWide Web thus far. As some of you may know — and I see some familiar faces in the crowd — Fidelity has had a site on the Web for about nine months now. And given how many people were there then versus how many people are here now, I guess in some respects that gives us veteran status. And I hope from sharing some of our

experiences with you today that we can give you a sense, those of you who haven't put a site up, on what to expect, what in general terms the investment in time and people looks like to put a Web site up and to keep it operational.

To that end I'm going to address three things this morning. The first one is what it took internally for us to get established on the Internet. I'll tell you a little bit about how we're doing, and give you a sense for where we're headed over the next year or so.

I think Tim did a great job in introducing this whole discussion this morning. He gave us several points, several observations that he and his firm have made about marketing or distributing products and services on the Net, that I would say is probably the first place that I've seen any conventional wisdom grouped. And clearly the conventional wisdom is still emerging about how best to use the Internet to serve your customers. Throughout my remarks this morning there'll be some recurring themes that basically revolve around the importance of really rethinking the traditional ways that you do business and adapting to what we believe is a fundamentally different way of doing business.

There are sort of three truisms that we've found. One is that what you don't want to do is do business as usual. You want to maximize the flexibility of the medium of the Internet itself to deliver unique content to your customers. You want to add some value for them having taken the time to visit your electronic storefront, and you want to give them a reason to come back again and again. So if you'd keep that in mind as we walk through some of my slides this morning, you'll see that comes up again and again as sort of the rules of the road, as far as we're concerned.

Let me give you a little bit of background about Fidelity for those of you who don't know us. We are a large financial services firm in the country, servicing about 20 million customer accounts. Those accounts are mutual fund accounts, discount brokerage accounts. Many of you may be participants in 401k or 403b plans that are administered by Fidelity. All told, those accounts gross up to about \$350 billion in assets under management, making us worldwide the largest privately-held financial firm. And in fact, we are a worldwide operation, which clearly has implications on the Net. We operate not only here in North America, both in the U.S. and Canada, — a united Canada, I hope all of you saw this morning — and in Europe, and in Asia.

We have three traditional ways of distributing our products and services: by telephone, mail, and with bricks and mortar. Our telephone business is extensive. Throughout the country, we have located five telephone centers, and we handle upwards of 400,000 calls a day from investors. We are one of the U.S. Postal Service's largest clients, as you can well imagine. And we have built for ourselves in the middle of the country just massive in-house direct mail capabilities. We send out something on the order of 100 million customer statements a year, and you can imagine all the other paperwork that investment transactions generate. And we have eighty investor centers located throughout the U.S., our equivalent of the bank branch.

So you can see that we're fairly ubiquitous in the traditional channels. And it's our intent to be equally ubiquitous in what we view as a fourth distribution channel, and that is the electronic distribution channel.

Our Web site, introduced last February, was really one in a series of forays into the electronic marketplace. We had owned and operated our own proprietary trading service, which goes under the name of Fidelity On-line Express, for several years. And we've had, what we call, an on-line investor center on Prodigy since 1992. Since we launched our Web site, we've also launched on-line investor centers on America Online and Microsoft Network.

[Tape change]

Mary Ruth Moran: To reach our customers and other investors electronically made a lot of sense to us, so we made the decision to form a specific group called Electronic Marketing, which is dedicated to attaining this ubiquity in the electronic channel. And we have a very simple mission, and that is to establish what we think of as the fourth distribution channel.

There is definitely, in our mind, a distribution paradigm here. Reaching people electronically in many respects is the equivalent to reaching them through the other three traditional channels that I mentioned.

On the other hand, to Jonathan's remarks, what you reach them with has to be a distinct product. And back to my sort of guiding principles earlier about value-added content and reasons for people to come back again — you do have to develop a distinct product to put through this fourth distribution channel. In fact, at Fidelity we regard it as a distribution channel. We clearly are in, as all of the panelists have indicated this morning, an information intensive industry. And another part of our mission is to combine the power of digital technologies with what we see as unique content assets available only at Fidelity to deliver content that's interesting, that's entertaining, and that's relevant to the investment decision.

One of our other panelists talked about the importance of having objectives before you begin experimenting in cyberspace. In fact, we had three very simple objectives when we began. We wanted to satisfy customers. We wanted to do it efficiently. And we wanted to simplify the investment decision-making process for people.

We found that about two-thirds of our customers owned PCs, and this was about a year ago when we did this research. Half of that group was already on-line. And these numbers are, by the way, BC numbers, these are "Before Christmas" of 1994. So we knew that there was a market out there that wanted to be reached electronically. In fact, we went a little bit further and we asked our customers whether or not they were doing any financial business or any personal financial management using their PCs. And half of them said they already were. Whether that was some spreadsheets that they had jury-rigged, whether it was one of the personal financial software packages, they were beginning to be immersed.

We also knew that this could be, if we managed it right, sort of a classic win-win situation. Delivering products and services and service on-line could be very efficient for us obviously. But also it could be very efficient for consumers.

One of our panelists mentioned that the most precious commodity that investors have is time. That's clearly the case. And we'll talk a little bit more about this later, but we've found that we can cut down what is for them typically a ten-day to two-week process to minutes.

And finally, to some of the points I made earlier, we clearly wanted to deliver actionable information. We wanted, when people finished a visit to our Web site or any of our other electronic storefronts, for them to be able to walk away having made an investment decision.

So we were pretty comfortable that we had sort of laid down the foundation for a successful experience on the Internet.

What I want to do now is tell you a little bit about what we had to do internally to make this work. And really the first thing is that anything that you thought was true in the traditional channels, any conventional accepted ways of doing business — we didn't throw them out, but what we did was we put them aside and we started with a blank sheet of paper. We really needed to rethink how we did business from the ground floor up. We needed to look at content in a new way. We were no longer going to be constrained once we went on the Web by the size of the ad that we bought in the *Wall Street Journal*, or the number of pages that we could put in a brochure. And we had to think long and hard about the resources it would take, to be able not only to get the site up and running but also — in the parlance of the accountants — to run it as a going concern once it was up. And we've had the experience, that I think Tim

talked about earlier, where it is X dollars to get the site up and running, and we would say that 4X to keep it up and running is probably even on the conservative side.

In terms of rethinking how we do business from the ground floor up, I think Fidelity is unique, probably one of few companies its size that is continually in a process of reinvention, to take advantage of new opportunities.

And so, for example, we have several thousand representatives staffing our eighty investor centers and our telephone sites. And we've done a pretty good job of training them to respond to investor inquiries and to help investors plan what to do with their money, either face-to-face or in person. Now, we needed to think about how we would have them work with investors electronically, like through e-mail, as Giles mentioned earlier.

We had just spent a lot of time and money building one of the largest facilities in the country to process paper. That was fine and paper will always be with us, but we had to plan for the advent of a time when we would be delivering a lot of the information that we deliver by paper today in something that approaches a paperless environment. And for those of you who are in my business, you know that it is one of the most highly-regulated businesses in the U.S.; we had to really work with the securities regulators so that we could help ensure that the combination of the regulations that are designed to protect investors and the technology worked hand-in-glove, as opposed to at odds with one another.

This was on one of my earlier slides, and I saved it until now. What we really had to do was make a conscious effort to resist what — the term we coined was “brochureware.” We had to really resist the impulse to take all of our existing collateral and simply convert it to HTML. Nobody would care. What we really had to do was take a good hard look at all of those assets that we had internally, the ones that the sort of immediacy of the Web and other on-line channels would allow us to deliver and that we'd never been able to deliver through traditional channels. And we had to rethink the nature of the material that we were delivering.

We had to make it fun. We run contents on our Web sites to encourage repeat visits. We had to make it interactive. We have a lot of planning worksheets that people can fill out on-line to help them get personalized or near-personalized solutions to their financial problems. And as I said earlier, we had to make it actionable. They had to be able to do something, to take some step once they had completed their visit. And I probably don't have to tell you — any of you who are operating Web sites right now know the lure at this point — it is important to keep that content fresh and current. That clearly has resource implications.

We've got systems resources that we need to have operational every day to maintain this Web site. And we know that we need time as a resource, because it doesn't take a lot of time to convert a brochure to HTML, it takes a lot of time to develop truly interactive content that's appropriate for the electronic channel.

You need people to maintain that content. And all of that costs money. I would venture a guess that somebody in the question-and-answer section would probably ask me, “How much money?” And so I thought we would anticipate that. I'm not going to tell you exactly how much money we've spent, but I am going to say that it is important to start now, however small you must start. Just understand that for every dollar that you spend getting that site up and running, it is four, five, even six dollars to keep that site really viable, to make it an asset for your company and to get people to visit it again and again. We've found, in fact, not surprisingly, that over time what you get out of this experience is in direct proportion to what you put in.

I talked a lot about reinventing some of the ways that we do business. I want to give you an example of that now that really touches on the areas of content development — keeping content up to date — and then managing through some of the effects, the domino effects that your electronic efforts have on the rest of your organization.

And I'm going to use an example. How many people here, just out of curiosity, are in the mutual fund business? Do we have anybody here? Okay. I'm going to assume that a lot of the rest of you are investors, so that at one time or another in your lives you've seen one of these documents, a prospectus for a mutual fund. Not one of the most interesting documents put out by the mutual fund industry, but probably the most important; certainly the most highly-scrutinized by the regulators. And Fidelity, as a direct marketer, is required to provide this document to potential investors before they can put a dime into the mutual fund in question. In this case, it's our Blue Chip Growth Fund.

Now, we wanted to deliver prospectuses on-line. We wanted our customers to be able to download them and take action on their investment decisions right there and then. We could have put this document on-line; you can see we just scanned it up here. We could have done the equivalent and put it out on the Net, but it wouldn't have worked.

So what we did was we had to completely — in concert with the regulators — rethink the way that we delivered this legally-required, very inflexible information. And so we undertook, with the folks in Washington, a project that would enable us to completely redesign mutual fund prospectuses for an electronic world. And you can see that we did things as simple as take what had been a two-column document and make it essentially a one-column document. We did things as useful as take the whole table of contents for the document, which is over to the left of the forward image, and make that all hypertext so that a user can jump to any section that's of particular interest to him or her and not have to scroll through the entire document.

And clearly, when we're sending one of these prospectuses through the mail, if the U.S. Postal Service actually delivers it on the other end, what we've sent is what an investor gets. The sort of analogous thing that we've had to do in the electronic world is essentially write/protect these documents, so that what we send is what an investor gets.

I should tell you that we have about fifty of these prospectuses up on-line right now, which is something less than a third of the total number of mutual funds that Fidelity offers. A dozen or more of those are updated or annually revised every month. And frankly, if we don't deliver the right version of the prospectus to investors we're out of business, we're shut down by the SEC. So clearly this updating effort has required a fairly significant investment in systems and in people to manage that update.

We've also had sort of a larger ripple effect throughout the organization that has touched on our legal organization, our customer service organization and our advertising agencies, both our internal agency and the external agencies with which we work. We've had to change entirely the way these parts of the organization look at content.

Back in 1992 for example, when we first launched our Prodigy site we had 800 screens, and what that meant to the legal department was that they had to look at 800 pieces of paper, because they didn't review things on-line then. They actually had to have everything printed out and they had to file with the National Association of Securities Dealers paper copies of all of the materials that we put out, despite the fact that they were on-line.

We've been able to change that process entirely so that all of our attorneys are reviewing documents on-line, and reviewing them very quickly. It takes many, many days to review 800 pages; just the paper-shuffling alone accounts for a couple of those days. Doing the reviews on-line has meant that we have been able to get very fast turnaround, and we have been able to respond to issues and get new content up within an hour or two on some occasions.

Our customer service representatives occasionally get calls from people who have looked at our Web site and want to follow-up with a personal conversation. It's not a matter of having a stack of brochures at their desk at this point; they have to be on-line and constantly looking at all of the content that we have out there so that they're well-versed in everything

available to our investors. And in many cases, the information that we're making available to our investors on-line approaches the level of detail that we make available to our representatives.

And then, finally, our advertising agencies have learned to work in a new way. The combination today to develop good electronic content is not an art director and a copywriter; it's an art director, it's a copywriter, it's a producer and it's a developer. They're all connected and work in teams in that sort of cross-technology.

All of this, the application of technology to the infrastructure, has resulted in a compressed turnaround. We wouldn't say that we've been entirely successful on this, but we've made a good start in being very responsive in putting very current and up-to-date information on-line for the benefit of our customers.

Clearly, in reorganizing we've had to pay a lot of attention to better integration internally. And I think we've addressed that.

The other thing that we've had to do in terms of reorganizing and reorienting jobs is really adopt a very different approach to developing content. We don't have a lot of people developing ads at this point; what we have done — and this may work for you, and it may not, there are a number of different solutions — is we've adopted something of a newsroom approach to content generation and development at this point.

And it looks something like this. We have meetings on Mondays, at which assignments are handed out. Everyone in the electronic marketing group and several of the satellite operations that work with us has a particular beat and is backed up by somebody else who can cover that beat. Based on consumer feedback that we get to our site — and we get several e-mails a week from people commenting good and bad on our site — based on information that we know is going on, things that we know are going on in the corporation, or general investment information, we develop an editorial calendar for the week and the beat people are responsible for pushing that content that gets developed through the channels, staging it and ultimately publishing it within some very short time-frame.

We've found that this gets us a lot closer to the customer, because it's so much more immediate. We're able to respond to their needs and complete that feedback loop so much more quickly than we can through the traditional channels.

So we're pretty comfortable that what we've done is get a good start on our Internet experience. It's a long-term commitment. Fidelity views the Web site as a distinct and important corporate asset, and it's something that we'll continue to put a fair amount of investment against. We'll continue to try to climb that learning curve.

So how have we done so far? We feel the same way that all of you who operate Web sites no doubt feel, which is that hits only tell a part of the story. I'm going to show you a little bit of this information, because it's pretty much the best that we have, and then get into a little bit more detail.

We have been extremely satisfied with the level of activity. After the first few months of sort of building we got to the level where we were averaging around 500,000 hits a month. We peaked in August, which is, interestingly enough, when we put our prospectuses on-line, and that really increased the traffic and the value of the site to people. We would expect to see another peak next month when we put a whole lot more of our prospectuses on-line.

Interestingly, we found that the traffic patterns on the Net are very interesting. There is a time when pretty much everybody in the country is sleeping, and the East Coast wakes up. And you see the traffic build throughout the morning hours as people across the country are getting into their offices and logging-on. And we find that we get a lot of that traffic from people's office locations.

At the same time we're finding that the on-line services browsers are really broadening the audience for the Internet, and I'm sure you've all seen that. Here are the top five subdomains or locations from which people are entering our site right now, and you obviously can see that prominent among those top five are the three largest on-line services. So their browsers have brought a whole new population of people to the Web. A lot of those people happen to be investors, which makes us real happy. So that's what has been in it for us. We've seen we obviously also capture lead information and conversion information, and without revealing to you the specific numbers I can tell you that the conversion ratios of new business to leads on the Web exceed those for virtually anything else that we spend money at this point, which may surprise you.

I want to show you a little bit about what's in it for a visitor to our site. I had alluded earlier to the fact that we've compressed a several-day investment decision-making process down to minutes in many cases, and this will give you an example. I'm going to play the role of an average visitor to the Fidelity Investments site, and I'll try to tell you along the way how we would handle this type of an interaction in the traditional media to give you a sense of the different timelines.

Visitors to our site need only type in www.fid-inv.com, and this is what he or she will see. As the investor — let's say am interested in sending a child to college. So I scan the on-line table of contents, if you will, and I choose to go into the section sort of in the center of all of those blocks called "Investment and Retirement Planning." Investment planning seems to make sense to me for what I'm interested in.

I get here and I start to look at the planning tools that Fidelity has offered, and here it is. Here's a cost calculator for college savings, and that will give me a sense for how much money I need to put aside to send my daughter to school. I input a couple of very simple pieces of information at this point.

Now, contrast this to what we've just done, where somebody calls Fidelity and asks for some help on college planning, and one of our financial representatives sends an order to Covington, Kentucky to have the paper version of this mailed out. Three or four days later that will arrive in somebody's home.

I'm able to fill this out on-line and start to make some decisions. Let's say it's several years before my daughter is going to matriculate, and so I decide that I'm interested in growth as my investment objective. I'll invest a little bit now, and with luck that will grow to be exactly what I need to foot the tuition bill several years from now. I see that Fidelity has presented as one of my options the Fidelity Blue Chip Fund, and I can at this point go into the mutual fund database and get a full range of current information about this fund.

Contrast that to the traditional environment, where I've received the worksheet on paper at this point, I've worked through it, and I've made my investment decision — I think, maybe, it's the Blue Chip Fund. Now I have to call Fidelity again and have them send me information about Blue Chip Fund.

Here, in the same on-line session, I can take a look at the fund. I had mentioned that I'm interested in growth, so I chart the historical growth of the fund. I take a look at some of the returns in tabular form. Looks pretty good to me. What I'd like to do at this point is get a prospectus, so I see from reading here that I can receive a prospectus by mail, or I can download it. I feel pretty comfortable that I've pretty much made my decision at this point, so I want to download the prospectus. We're back where we were earlier, and I'm ready to fill out an on-line application.

Several days later, had I done this by phone, that application and that prospectus would arrive in the mail. So what used to take days is now taking minutes for our investors.

I think you can see that from our standpoint, what we're trying to do is tabulate hits, tabulate leads and tabulate conversions, but we're really trying to focus on the customer's experience. We, as I mentioned, get several hundred e-mail comments a week in response to our request that visitors to our site tell us what they're thinking — what's good about the site, what they don't like about the site, what they'd like to see that isn't there right now. And we look at all of those comments and respond to them where appropriate.

Here's a couple of examples, and I'm sure it's not a surprise to you that I would show a very favorable one first. And so this one goes something like this: "I like your page quite a lot. You know, yadda, yadda, yadda. Please make more prospectuses available on-line." Done. This is easy. We'll have in the next six weeks to eight weeks all of our prospectuses for nearly two hundred funds on-line. This is simple. It tells us something is working. It tells us if we do more, we'll probably do more business.

One not so positive. "The text on your headers and footers is difficult to read. Can you do anything about this?" Well, of course we can do something about this, and thank you for asking. We said, "Okay, well this guy just doesn't like the color yellow." We got the comment again and we said, "Well, somebody else doesn't like the color yellow." We got it twenty times, and we said, "The color yellow doesn't work. Let's change it."

And so you can see that this kind of thing is very simple to do. It's very simple to invite this feedback. All of us no doubt are on-line. We know how happy we are to provide feedback when people ask, and this is real important to putting together a good experience for your customers. Listen to what they're telling you. It doesn't require a lot of costly research and it doesn't require the consumption of enormous amounts of time; you can build it right into your site and make it really useful and simple for people.

We've been very happy so far. It's never enough. What we've tasted over the last nine months has just whetted our appetite to do more on the Web. There are a couple of areas that we're going to be focusing on in 1996.

New content. I've tried to express how important the content development and maintenance process is, and the commitment that one makes when one puts a Web site up. We're going to continue to try to leverage the resources at hand at Fidelity to do more and more sophisticated interactive planning tools, for one thing.

Focus more on news and current events to make the site most relevant to investors. We're going to enhance electronic communications. We invite the comments today on the commercial on-line services and we engage in two-way e-mail and have a pretty extensive e-mail support team that responds to all of those e-mails down in Dallas. You can look for us to do a lot more with e-mail and other forms of electronic communication to really realize the promise of the electronic community that you can create on-line.

There's been some talk this morning — no doubt there's been talk at other conferences that you've been to — about how preeminent the importance of the brand becomes in the electronic world, because the electronic world is, of course, so democratic. Fidelity may be the biggest company in our industry, but your computer screen doesn't get any bigger, just because you have Fidelity's Home Page up, than it would for one of our smaller competitors. That, fostering that community and that sense of belongingness among your customers, is very important. And so you can look for us to do a lot more in the area of electronic communications.

And then, finally, transactions. We don't do transactions on the Internet and the commercial on-line services today don't do financial transactions. We do have our own private on-line service through which our investors can trade if they wish, and we're clearly very interested in and committed to offering account access and transaction functionality on-line to our investors.

But the way we look at it is this; we've spent fifty years building a trust with our customers. In the case of transactions on-line, to us it's more important to be right than to be first. The business risks that a company of our size and scope, and a company that comes under the scrutiny that we do, are just too high to go out there blindly right now.

Nonetheless, we continue to work for that day that we can pull the switch and be offering our customers direct access through the Internet.

Thanks so much. I'd be happy to answer any questions as I know my fellow panelists would.

Tim Duncan: We'll take some questions for the panel. Before we do, I was handed a note from Mecklermedia, the sponsor of the conference at break, stating that they're very sorry about the lack of coffee. If you are willing to go by their booth out on the floor and sign a short affidavit that you were unable to obtain coffee at this session, they will be happy to give you a free copy of the August 15th issue of WebWeek.

M: [inaudible]

Tim Duncan: I'm sorry. You're going to have to speak up very loudly.

M: [inaudible]

Mary Ruth Moran: Okay. The question, for those of you who didn't hear, is if a visitor to our site uses some of the information there, perhaps fills out a couple of the planning tools but doesn't choose to invest or to request additional information at that point, how do we follow-up with him or her? And the answer is, we don't.

This was an issue that we really had to think long and hard about. Obviously, being marketers we are hungry for every piece of information we can get about anybody who ever expresses interest in us; on the other side of that coin, however, was our concern that people would feel that their privacy was being violated, and they wouldn't give free reign to their impulse to go in and sort of shop around if they believed that they we were collecting data on their every move. And so we very deliberately do not do that.

M: [inaudible]

Mary Ruth Moran: You absolutely do. The business model on which Fidelity is built is that investors make their own best investment decisions. They are self-directed. They tell us when we can help. Now, that having been said, we obviously spend a fair amount of money advertising to get all of you to think of us when you're going to make an investment decision, but it's up to you to contact us.

W: [inaudible]

Mary Ruth Moran: I'll repeat the question.

W: You mentioned downloading a prospectus and filling out an application on-line, then you said you don't do transactions.

Mary Ruth Moran: Right.

W: How do those two fit together?

Mary Ruth Moran: They fit together in what is something of an unhappy marriage, to tell you the truth. This question is sort of near and dear to my heart. The question is, you can download a prospectus and you can fill out an on-line application, but if Fidelity isn't doing transactions how does that square?

And the answer is simply, yes, you can download the prospectus. Yes, you can get an application on-line. You cannot transmit it to us on-line. And so we can take the on-line experience right up until that point. And then, guess what? Until the regulators will allow us to recognize digital signatures, and until we're comfortable with the security, you have to print that application out and send it to us.

Tim Duncan: How about right here.

M: Again, a question for Mary Ruth. You mentioned Fidelity is on the Web. I'm curious about your [inaudible] on those four [inaudible].

Mary Ruth Moran: The question has to do with Fidelity's position being ubiquitous through the electronic channels. What is the relative investment on the Web versus the commercial on-line services that I mentioned that we also have a presence on?

It's actually been an interesting issue for us. When we first began, our view was to offer equivalent content on all of the channels and to be indifferent to which channel a customer or prospect chose to reach us on, not to make that choice or force a choice on people but to give them comparable information across all of the channels. When the commercial on-line services introduced their browsers, that sort of changed the paradigm a little bit. And I think what we've done, generally, is put comparable information across the commercial on-line services and then take that information one level deeper on the Internet, generally speaking, so that somebody can get a base level of information there, and it's pretty comprehensive on the commercial on-line services. If he or she wants to dig deeper, we are essentially a click away through the on-line browsers.

Tim Duncan: How about right there.

M: For Fidelity and for First Albany, this extra four to six dollars that you're spending to maintain sites; where do you spend that money? On content development? On technology?

Giles McNamee: Go ahead. You get to go first.

Mary Ruth Moran: Where do the extra four to six dollars go that you spend for every dollar you spend in investment? Is it content? Is it technology? What is it?

You know, technology is a wonderful thing and anybody who ever thinks it will replace people in the business world is sadly mistaken. The single largest expense and the largest cost item in that four to six dollars is people who know how to run a Web site, frankly. People will always be important to this, to this equation. We can take people out of the sort of routine interactions and let our customers interact directly with us through inquiring, ultimately transacting business, routine and repetitive business, but we'll have just a different set of people who will be developing and maintaining our Web site and our other on-line presences.

That having been said, the second biggest item in our experience has been content development. It does cost money. That's not a reason not to start, if you don't have a lot of

money to fund this, because you can, as all of the panelists have said, start very small with some small applications. But you will be making a long-term investment to enhance your site over time, and content costs money. Technology is the last of those items.

Giles McNamee: In our case, our efforts are nothing like as aggressive as Fidelity's. The most sophisticated things we're doing are targeted to a specific set of people who are already clients, and we're delivering to them something they've actually previously asked for, which was access to our databases. That requires significantly less effort in terms of content development. We've already spent the money building the content, and the *Internotes* allows it to be regularly refreshed onto the Web so that it's basically always up-to-date. The hardware and software components that go around the process, are a never-ending opportunity to write checks.

John Guerster: One of the interesting things that I've found in the last sixty days, that's been very surprising, is that people have come to us looking for content. They've got no mechanism as Fidelity has developed internally to develop content and information to keep their sites fresh, so they're beginning to ask us to try and develop that for them. And one of the things I'm coming to believe is that the next decade for financial services firms — information may be sort of the toaster of the next decade. People are going to come to you for information, and that's going to be your giveaway.

Tim Duncan: How about right there?

Giles McNamee: We'd like to get paid for it. That's our business.

M: I believe you said that there was a centralized area that receives and processes your e-mail or responds to e-mail. What is the background in grooming people who work there, and is there a particular program that's used, and what are the legal implications for returning e-mail, providing first a home-based [inaudible]?

Mary Ruth Moran: I had mentioned that we have an e-mail response team down in Dallas. The question was, what type of people staff that organization? How have we trained them? Have we trained them? And what are some of the regulatory and legal implications of e-mail correspondence with investors?

It's interesting. The skill set that an e-mail rep at Fidelity needs to have is not unlike that of a telephone rep or a branch rep in the sense of command of knowledge of investing and of Fidelity's investment products. But then there is a divergence. There are some people who are very good interpersonally on the phone or face to face, and then there are some people who are better correspondents in writing, and can express their ideas better and articulate thoughts better on paper, or in this case through e-mail. And so we try to select people for that e-mail operation who exhibit that latter set of characteristics. They go through the same training that our telephone and branch reps do in terms of the investment markets and command of the product set that Fidelity offers. They go through supplemental training to help them in the use the power of the written word. And so there is a fairly specific training module that they also go through.

In terms of the regulatory and legal impact of e-mail correspondence, those of you in a business regulated by the securities regulators may not be surprised, but rather chagrined, to hear this, and that is that e-mail communication is viewed still by the regulators as written communication and is subject to the regulations governing written communication, which are

frankly a lot more stringent and difficult to adhere to than verbal communication between a rep and a customer.

In fact, every single e-mail that we send out to a customer has to be reviewed by a rep who has certain securities registrations. In this case, it's a series 8 registration, and so our team managers have to be series 8 registered. And all of that correspondence, believe it or not, still has to be filed with the regulators after the fact.

Tim Duncan: We've got time for two more questions. How about way back in the red?

W: My question to Fidelity first of all, [inaudible].

Mary Ruth Moran: Do you want to go first or do you want me to?

Giles McNamee: Sure, I'll go first. The question was, if we won't talk about money we spent, what's the size of the staff that put together the pages and maintains them?

In our case the number of people that put it together is about five or six, but that doesn't count the people who are involved in the other... As I said before, we use Lotus Notes. In the *Internotes* process there's another three or four people who were involved in connecting Notes to *Internotes*, which took about a week of their time, and then they're out of the loop. And in terms of maintaining it, we currently have three people who's full-time job is to maintain it. But having heard this discussion, my guess is that we probably will need some more bodies. But we need more hardware and software too.

Mary Ruth Moran: In Fidelity's case, the number of people who maintain our Internet Home Page today goes something like this: the entire staff of the electronic marketing group, which is sort of the business line responsibility for all of the electronic products and channels, is something on the order of fifteen people now. Just one of those people is the Internet business manager, and his work is largely with a set of developers. And Ralph, how many developers would you say that we've had working day to day on the Net at this point?

[Ralph]: Probably, like you said, there's a variety of people. You know, three or four work everyday on [inaudible]. Then there's a whole other group of [inaudible].

Mary Ruth Moran: And that's just on the development side. Ralph was telling us is three to four developers on a day-to-day basis. We have an interactive marketing group in our Fidelity advertising agency, and there are three people down there on any given day who are working on the Internet Home Page. And we have one full-time dedicated resource in our legal operation. So all told, on any given day, there are eight to ten people just working full-time, 8:00 to 5:00 on the Internet.

Tim Duncan: Last question.

M: What do you think about the [inaudible]?

Tim Duncan: Jonathan, how about you?

John Guerster: Yeah, the question as I understood it was, what do you think about the reasoning for delivering payments with something like cybercash or digicash? Is that right?

I guess our view on the cash side is probably, from a vendor perspective, that we see cybercash or digicash, or First Virtual, for instance, as being alternative payment technologies. And so our model is that to offer value, they'll be used and we should support them. But there's a game in the world of electronic cash versus real cash that is being played right now in the securities space, and I think, to the degree to which consumers feel comfortable with one versus the other, that is the degree to which one of those will be successful or all of them.

Tim Duncan: Thank you for coming.

INTERNET FINANCE FINANCING AND GROWTH STRATEGIES IN THE INTERNET BUSINESS



MODERATOR

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SPEAKERS

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Emily Green
Senior Analyst, Forrester Research, Inc.
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Partner, Testa, Hurwitz & Thibault
Peter Marx, Esq.
Chairman, the Marx Group
Robert Nolan
Vice President, Goldman Sachs & Co.
Mark Walsh
Senior Vice President, General Manager, America Online

Timothy Duncan: Bill Bradley, the Senator, tells the story about being a guest at a testimonial dinner in his honor, and it was before people were to speak, while people were having dinner, and the guy came around the dinner table passing out the little pats of butter for the rolls, and Bradley got his pat of butter and said, "May I have another pat of butter?" And the guy handing out the butter said, "No."

The host for the testimonial dinner was sitting next to Bill Bradley and he was quite embarrassed, of course, and said to the guy handing out the butter, "Do you know who this is?"

And the guy handing out the butter said, "No."

He said, "Well, this is Senator William Bradley, and he's a graduate of Princeton University, where he was an All-American basketball player. He was a Rhodes Scholar, played professional basketball for fourteen years, led his team to the National Championship, was named to the All-Star team twelve out of his fourteen years, was elected to the Senate for three consecutive terms and is a likely candidate for President in the next election."

The guy handing out the butter looked at him and said, "Do you know who I am?"

And the host of the dinner said, "No."

He said, "I'm the guy that hands out the butter."

Which struck me, when I heard it, as a metaphor for a lot of Internet-related businesses. Seems a lot of people are trying to be the next Microsoft, and they, in fact, end up being more the guy handing out the butter.

But we're going to talk about that today, and I get to do my own little infomercial here, so I'll do that quickly and give you my points of view as a participant in a relatively new Internet-related venture, and then we'll get on with some of the other speakers. But this is what it all pretty much gets down to, as far as I'm concerned. I would suppose that's kind of a question that most of you want to ask today and have answered: How do you get an Internet-related business worth ten million dollars by 1996? And I'm going to have an answer for you in about ninety seconds.

First of all, What I do, my company, The Duncan Resource Group, is an Internet finance network. Its focus is basically to be a center, a place on the Internet whose sole purpose is to serve a vertical market, a very strictly-defined vertical market, and that is people that work in the fields of corporate and commercial finance. It's for professionals, for people whose business is finance. We started out with a directory, primarily to attract an audience, which we succeeded in doing. It's a directory comprised primarily of sites related to and of interest to our target audience, with some additional concept described in those sites, and the services and products that those companies produce.

We also do consulting with financial service firms to provide them with Web site design and maintenance in strategic partnerships in that specific sector, as well.

Eventually, we hope to be delivering content. We actually will be delivering content next month, in conjunction with Securities Data Corporation. We're going to be publishing weekly summaries of IPO and M&A activity across the United States, and then a monthly and quarterly wrap-up of different activities, investment banks and commercial banks around the country.

Our objectives as a business are primarily to attract a target audience in a specific, vertical business market; to learn what that audience wants from its use of the Internet and help our clients sell to that audience; and then, eventually, to help our clients transact business over the Internet.

We are, in effect, in the content business, and for you folks out there that are in that business or considering it, from what I've learned, the advice I would give you is that despite all the hoopla and hurrahs about this business any start-up still requires time and capital; and I'm amazed sometimes that I've talked to a lot of people that have been in business now for three to six months and are complaining because they're still not making money. It's a long, slow swim underwater, whether you're in an Internet business or another business, if you're going to begin a start-up.

I think primary revenue generation today in Internet-related business, if you're in the content area, is going to be from providing your clients with education and know-how. Revenue generation, I believe, is really something that's not going to come for quite a while — at least eighteen to twenty-four months before anybody can meaningfully raise revenue of their existing business on-line, with a possible exception of Internet-related, software-related products.

I think this is an information business. It's not entertainment business, and I think — as I go on and on — that I'm more and more convinced that this is something that's just essential to be successful in a content-related start-up. We're starting, in the last sixty to ninety days, to get more and more requests from our clients in the financial service businesses, that they need to be able to produce more information on-line in their own Web sites. They need to produce content; and in fact, I'm coming to believe that information in the financial services business and in other industries will essentially become the toasters of the next decade — and that's what I have to offer.

So, back to my question, my original question, "How do you get an Internet-related business worth ten million dollars for 1996?" You invest twenty million in 1995.

Our first speaker is Mark Walsh, and Mark is the Senior Vice President of AOL Enterprise. He's basically the business-to-business guy at AOL. He came to AOL via a very highly-reported executive recruitment in the Spring from GD Genie, where he had been the President of that group. Before that he was Vice President and General Manager of Interactive Services at CUC International, and part of that he was in charge of new business development at HBO. Mark has a B.A. from Union College, and M.B.A. from Harvard Business School. He tells me he dances well, he's a real swell guy and a very delightful speaker — Mark Walsh.

Mark Walsh: Verbal dancing will be the specialty today. I'm not the butter guy, I'm the bread guy.

I'm interested if I could just a sense of the crowd: How many people here belong to one of the major on-line commercial services? How many people here belong to AOL? For those of you who don't, please give me your home address and we have the planes fly over your house and bombard it with disks for the next few weeks. Happy to do that. How many people have heard me speak, so I know which jokes not to use? Okay.

Today's talk, I think, is going to be a fascinating one for a four-hour stint. I'm very much in appreciation for you people for showing up for a four-hour talk; I sort of thought it was some misprint. By the way, we're going to lock the doors and no one is allowed to leave for four hours, just so you know. So, you will learn in the next four hours.

I think a portion of what I'm going to try and cover — and I hope that at the end of the day you will feel you've gotten some delivery on, if Tim's done his job as far as the guest list — is feeling a little bit about what the future is going to hold for us all, particularly from the financial side of the house. As Samuel Goldwyn, the ubiquitous Hollywood producer once said: "Never make predictions, especially about the future," and effectively I think we're all in the same boat right now, which is that we're making predictions about a business which is not only unpredictable, it is beyond predictability.

I felt as I walked the halls and the paths of booths out there today, lovingly I say it was almost like sort of a "random claim" generator, that whatever the booth was there was a random series of phrases like Empowerment, Site Creation, Maintenance, Applicable Tools, whatever, and it's so confusing to even those of us in the business that you can imagine what businesses and consumers find about this industry. And until we're able to describe ourselves in more cogent and taut terms, I think we'll all have the same types of problems, which is that we're an idea whose time, perhaps, has not yet come, or that is coming in ways we can't predict, and will be of service to consumers and businesses in ways that we will find out almost after the fact.

But my topic today is to talk about getting money to start companies. Getting money to grow your company. Getting money to cash in on what some argue is truly one of the larger new business ways to hit the American, or perhaps the world business cycle, in three, four, five, some say eight or nine decades. It's a pretty big claim. I spoke with one of the America Online's largest shareholders today. He, of course, is always right, just so you know, and I continue to remind him about that, and he suggested that by the year 2000, there will be two-hundred million e-mail accounts, worldwide — two-hundred million e-mail accounts. He went through the math and at first I scoffed at his number, but as he went through the math and how he reached that number, it actually made some sense, which just goes to show you how the math in this business can sometimes make sense in ways that is surprising and scoffable prior to your going through the exercise.

But America Online has, in the last year, exhibited a lot of the behavior sets that you'd like to see from the outside of investing in and trying to grow content or connectivity or software types of business that help its goals — and, I believe, also help the industry. AOL is a company that has grown about a thousand percent in the last two to two-and-a-half years. That's fun and sort of not so fun at the same time.

I've got a couple of jokes about AOL. I've been there six months. One is that really the job there is you show up and find the desk and a phone and then make up your job for the day and go home and make it up the next day, that there's sort of so much opportunity, so much going on, that there's no predictability about your own job content, and I am proof of that. I've had three and four jobs in six months.

The other is that at AOL, if you took fifteen random people from the company, lined them up against the wall and interviewed all fifteen, two or three of them would have the exact same job, but wouldn't know about the other people. That's a function of a high-growth company. I think it is not something if you're a shareholder to be worried about. However, it does imply something that I think all of us in this room share, which is what as the fighter pilots like to say when they were surrounded by enemy planes, "I'm in a target-rich environment."

We are in a target-rich environment today. We have been for the last year or so, and I would suggest that we are in a maximum target-rich environment for the next thirty-six to forty-eight months. But, what are the targets? Are the targets better and cheaper connectivity? Well, I think the term by [Russ Siegelman] of death-spiral pricing for connectivity, he of the Microsoft Network, is correct. Connectivity will be a very difficult business to make decent, defensible margins in.

Are we in the business of software? Well, there are those who argue that the browser and the other production style Web site creation software business will be difficult, because no matter what kind of browser you come out with, someone will come out with a better browser. Standards are still unclear. The standard-setting bodies are, perhaps, being slightly shunted aside by very aggressive corporations that are making very aggressive investments and setting their own standard set; and I have no quarrel with any of this behavior, it's just the nature of the beast.

So, the third [point is] content. Is that where we can make a difference? Is that where a target-rich environment exists today? I would suggest, yes. That the content business, or the manipulation of an attractive presentation of preexisting content, is where a lot of the investment dollars will ultimately flow in the on-line services business — be it Internet based or proprietary consumer services, like AOL.

For the sake of this talk I'm going to stop making the distinction between Internet-based and proprietary consumer services like AOL, because our new 2.6 software has full Web-browser capability built into it. Our major competitors, Prodigy, CompuServe, etc., all now have Internet outreach. So, you may argue with the software, and how closed the systems are — closed is bad, open is good — but I'll stop making that distinction, because frankly it will make the speech too difficult to comprehend.

But let me talk about how target-rich opportunities for content developers or presentation packagers of preexisting content can happen at America Online. Then I'll make a few short observations about where future investments and opportunities might be, and then I'll hand it over to folks in the panel forum who are better able to finance things than I.

Today, we have an ongoing investment fund, and there's a natural place to put it called the "AOL Greenhouse." The AOL Greenhouse — in your program, just to helpfully alleviate confusion, it mentions that I will talk about Indians and Buffalo — what I meant by that when I wrote that down was that the Indians, American Indians, when they killed the buffalo, were famous for being efficient in the use of all pieces of the buffalo. They carved out the horns and made drinking vessels of it, they used the hide as blankets, the obviously ate all the meat. They used the hoofs and the legs and the bones for a wide variety of uses. They were ultra-efficient in the use of the beast after they killed it.

The American Cowboy, in his infinite wisdom sort of riding across the range, would just shoot buffalo for sport, from trains and horses, just kill them; and it struck me that what AOL was trying to do with Greenhouse was become more "American Indian-like" in its ability to be more efficient in using relationships or building relationships with content providers, that it could may be put up AOL on a place on the Web and get other visitors from outside of the AOL world to visit them, and be more efficient in the distribution of and the making money off of the content. So, the AOL Greenhouse is a way to do that.

We've done about twelve deals so far with individual entrepreneurs and groups of people, who receive checks from AOL ranging from the low to the high six figures, that's typically the range that we look in. AOL typically receives a piece of the equity or some sort of cash, a guaranteed cash stream from the company in response for its investment; and frankly in its investment program it says: "For the money, you get started and I'll give you access on AOL." So the four million members, or eight million eyeballs that is AOL — or approaching eight million eyeballs that is AOL — is sort of natural distribution for the content provider to start off with.

Secondly, AOL has been very active in purchasing companies. When your stock is at a "P" rate that is like ours, it's very aggressive. You have the ability to purchase companies with stock, and the owners of the companies are very happy to take it; and it's a matter of public record that we've given a lot of AOL stock to a number of corporate owners, company owners and individual entrepreneurs who started companies like WebCrawler and GNN and Web Soft and WAIS, and Redgate and others, Meteor, who have received AOL stock in a pure investment or purchase play. They are now part of the America Online family of companies or they're part of America Online, and that stock investment, with some cash kicker, typically is another rational way that we acquire companies to make ourselves grow stronger.

The last and the hardest to describe in the investment world today is what is typically monitored, [and that's] joint ventures. Joint ventures are a little bit like the six blind men and the elephant. One grabs the tail, one grabs the trunk, one grabs the leg. To each of those people, the elephant is a different animal; and I think if we canvass all the folks in this room and ask them what a joint venture was, you get a lot of different answers — and I think that's good, that's what a joint venture should be. It should be the result of hard and serious and — hopefully — friendly negotiation between the two sides, where the money is shared, where the equity potential is shared, future equity is shared, potentially creating a new entity that both companies invest in. All of these models are being used, or certainly discussed and played out within AOL now, with companies that we're discussing and sort of placing our lot together with.

Now, what does this kind of corporate behavior mean for the industry? I know AOL is certainly not alone in these types of models of outright purchase, investing in small growth companies and joint venturing. Every single on-line service out there, every single one that is in the consumer on-line service that's in the marketplace today, has something similar to this. Prodigy just recently announced a Greenhouse-like — we think from what we could read in the press release — a Greenhouse-like effort to initiate and grow an entrepreneurial content provider relationship. So, there's nothing new under the sun here.

But what does this mean to the marketplace? As we reach out to entrepreneurs, we reach out to divisions of larger companies who want to split off a division that maybe isn't getting the kind of entrepreneurial support that it needs. What does this mean for the consolidation, which many say will ultimately come? When Alexander Graham Bell invented the telephone, there sprang up about three hundred and fifty telephone companies in the United States. About sixty years ago, there were about fifty car companies in the U.S.

My conclusion is not necessarily to suggest that of those fifty, forty-seven were wrong; but Darwin was right, and when Darwin said only the strong survive it does not necessarily mean size. In the same sixty years since fifty car companies disappeared, many other massive, powerful market-dominant American corporations in a wide variety of fields — retailing, computing, communications, transportation — have also failed, and smaller companies have grown. So my implication of saying Darwin was right is in no way meant to imply that our size or market momentum is a protective barrier, and smaller companies must come to us in a state of supplication and we will deign to give them some attention.

There are companies out there making less than five million dollars a year who three years from today will be some of the dominant companies out on that platform and out on that floor. So, the idea of Darwinism being correct, to me only implies one thing, and here's the small piece of advice I will give. Whatever it is that you or your company do for a living, I would suggest, if you can't describe it in under two minutes, then it ain't a business.

And I mean in no way to criticize, but as I mentioned, going around these booths it's a random claim generator. The Internet and all of its opportunity makes us use jargon so much that a lot of our business plans and our focuses become very diffuse. So there's nichemanship. Although sometimes it's difficult to suggest, "Gee, I'm in a niche business," nichemanship really is the secret of what's going to happen here.

The last two things I'd like to suggest are: One, planning. If you ever feel that there is some master plan from deep, dark executives sitting in some large tower who know where this all will go, rethink your thinking. We are all making this up — all of us. This industry, this platform, this set of consumers, this set of constituencies, these sets of software tools, these sets of connectivity solutions, are all brand new. All of you will hear and try to have models applied to you, just like the cable business, just like the telephone business, just like the railroad business. There is no business just like the business we're in. The only business where in is change; and I don't personally remember, looking back on American business, a time when change in one industry was so dominant a theme.

F. Scott Fitzgerald was once asked what it's like to become poor. He became quite poor at the end of his life, and he said, "First, it happens very slowly, then it happens very suddenly." We have had a slow period of three to five years of growth of the Net, growth of the browser business, growth of on-line services, growth of content providers; and now we are starting to go vertical, and I would only suggest that if you are in the business of trying to start an on-line service business, be it content, connectivity or software, that you at least consider speaking with America Online either in Greenhouse or in our venture development side, or in our sort of joint venture type of model as a partner to help you grow that business.

And with that, I will thank you for your attention and, I guess, take your questions later.

Timothy Duncan: Thank you Mark. I like to be different, and every company I run into wants to be the next Microsoft or the next Netscape. So when people ask me a question: "What company will you grow up to be?" I always tell them "Goldman Sachs."

Bob Nolan, our next speaker, is the Vice President of Goldman Sachs. He's in their media technology and information group. He was one of the founding members of that group that was formed in 1992 to take advantage of the convergence of those three areas, and Goldman Sachs, in the last year, has participated in a number of very significant transactions relating to Internet-related business, including the initial public offering in May of UUNet, which they were the lead manager for. So, here is Bob Nolan.

Robert Nolan: Thank you Tim. I'm glad to hear you value Goldman Sachs so highly. I always thought America Online was the company we wanted to grow up to be. We're working on that. It is fitting that I follow Mark in his commentary, because his company does bear on a number of items we'll touch on, particularly the first one.

I thought in honor of today being Halloween — I'm rather curious as to where my children are going to trick-or-treat this evening. I was also curious to see that cyberspace has been added to the list of possible neighborhoods. The on-line service companies, such as AOL, CompuServe, Prodigy, MSN, and even access providers such as Internet MCI are all offering various treats for those adventurous souls that want to visit them this Halloween. And the feature I like the most is the one that's offered by Internet MCI that enables the user to select a

Halloween costume from the Microsoft CEO, Bill Gates. Now, I'll let each of you deal with that issue. I thought maybe a Gap jeans ad might work in this case. There are any number of potential answers to that question.

But what it does do is raise, again, the issue of an interesting application on the Net, and as always the question for those of us on Wall Street is about how many people care and how many participate. Now, if you believe the Nielsen research numbers that were out in the paper this morning, there are quite a few of us. Thirty-seven million people supposedly have access to the Internet as we speak. Half of them are age 16 to 34, and frequent users. The question, of course, for us financial types is what services will they use, and how will they pay for them; and my comments this afternoon are designed to review Wall Street's current affinity for all things Internet related and to discuss the notion of cybercommerce, its future and its ultimate acceptance as an investment concept on Wall Street. As Lee Stein, the founder of First Virtual Holdings has postulated, it may well be the beginning of the biggest market in history.

As an investment banker who has worked extensively with communication companies, media companies and networking companies, explosive growth and development of opportunity for Internet-related commerce is exciting and daunting. Other panel members this afternoon will discuss the venture capital opportunities and the private market sources of capital. My role is to discuss the public market opportunity; and with the recent successful initial public offerings by companies such as UUNet and the Internet access area, and Netscape in the Internet's software category, investors are clambering for more compelling ideas and concepts. We certainly believe that the concepts related to cybercommerce may well provide that next wave of excitement.

So let's review for a moment how we've arrived at this stage of the Internet. This is clearly one of the reasons we're all here today. It is a hot topic, one that merely confirms the notion that it is written about often and with good reason. Revolution of the industry is fairly straightforward, and you're all familiar with its academic origins; but what is really important here is with the growth of the WorldWide Web and the additional services being employed. We now enter into the major capital infusion stage, both public and private capital being utilized for many small startups — and many that were previously small have become major companies in their right.

A quick overview of the Internet. It is a global network. It obviously provides any-to-any point of connection. The real point is that it's the world's largest on-line information exchange. It is a network of seventy thousand plus disparate computer networks. It has grown from less than a million paying subs in 1994 to our projection of twenty-two to twenty-five million by 1997. The top three uses, of course, continue to be e-mail connectivity, file transfers and access to the Web.

And we see the Web as the key catalyst in the growth of the use of the Internet. Clearly, the easy point-and-click server software has been a major catalyst in that it has provided a multimedia printing press arrangement, and obviously the hyperlink is one of the real issues that will allow it to continue to grow in the future.

Now, we take a look at this market in broad form and then in six categories, and we've projected what we think the revenues are; and chances are that these are very conservative, since they bear from '94. But just to put it in context — the total market: we saw '94 revenues of little more than 800 million, growing to 4.3 billion, a 72% compounded annual growth rate. Breaking that down, first the hardware: we see it growing at roughly 60% from a '94 number of just under 500 million to almost 2 billion in '97. The expertise category, in which we include consulting, network management and support, we also see as a huge grower: 78% compounded annual growth rate, totaling 335 million in '97. Access providers, which we're going to touch on in more length, growing from a base of 135 million to 860 million in '97.

This will, clearly be the wave of the future. The software providers, and this is very conservative estimating in our mind, '94 to '97: 44% compounded annual growth rate. The service providers, which is the transaction advertising, marketing services available, we think will grow at almost 300% compounded annual growth rate: roughly 400 million as a revenue figure in '97. And, finally, of course the content providers, which may well be the mother lode ultimately: the directories, the media — 300% compounded annual growth rate.

These points are also made graphically in a bar chart. I'm not going to dwell on them. The fact of the matter is, as you look at each of the six categories, they all hold ample opportunity and I again would argue that software services and content are probably understated as we look forward. This merely looks at the access market to gauge the contribution from the consumer and the commercial side, and see them in terms of growth rates. They're both in the 80% compounded annual growth rate segment. The fact of the matter is they're both contributing mightily to the access business. We think they'll both be contributors to commercial and consumer side in many of the categories.

What do we think will drive expansion on the Internet is use. Obviously technology and culture changes, and [these] are already underway in corporate America.

Mark already touched on the lower cost that we'll see on the access side. I think we'll see it on service side as well.

The trends that we're seeing clearly are bandwidth demand, and that continues to grow; and as you'll see the uses are going to demand more bandwidth as we get into audio and video. The international acceleration has already begun on the access side that's underway with a number of acquisitions, and the consolidation of partnering intensifies both domestically and internationally, a number of fields. The demand is increasing, as we mentioned.

There are many more high-speed connections growing that are increasing. Businesses are ordering multiple connections, and the customers, not surprisingly, want bundling of services. They want a host for the Web server, and of course they're looking for security and reliability in use of the Internet.

Then we get to what the board middle-marker will be, and Mark, again, touched a bit on this concept. What is the role of the service provider, and what is the role of the Internet access provider? They both bring historically different skills to the table. But I'm not sure that hasn't blurred already, as we speak. The announcements came out yesterday on the part of AOL and the part of AT&T regarding AT&T's desire to get onto the packaging side, from just providing access, and of course AOL provides not only packaging but access. So I think we've seen a complete blurring of how we approach the marketplace going forward.

Very quickly, on the services side: we're projecting 35% subscriber growth. We expect 40% through '97, reaching more than 2 billion. I think the key point here is that it's the only industry to-date with proven experience in interactive services. There are, however, many competitors coming in this field. Microsoft Network, as you know, is underway. We think it could grow to two-and-a-half to three million subscribers — I don't mean to scare you Mark — within the next eighteen months. But many of the listed companies here, and clearly the larger ones at the bottom — IBM, MCI — already started on its path, and of course the regional holding companies, once they're freed up from long-distance restrictions, may become larger players as well.

But the uses continue to be those that we identify at the outset: e-mail, chat, forums, 50% to 75% of the usage. The people, the computer communications, content, access and of course downloading information is in the minority: 25% to 50%. I do think that as we've now developed community and developed packaged information for communities you'll see more use of the commuter communications in the future.

Now, in terms of the services blending with the open Internet, there is no question that the major services will provide Internet and Web access in '95. I think it opens up many opportunities for the service companies, mainly in the form of subscriber acquisition opportunity, from the Internet.

The problems to be solved that remain on the Internet are clearly about industrial-scale privacy. This really speaks to the corporate user. But security and reliability are primary issues. The licensing and copyright issues — I know we have some attorneys on this panel, I'll let them address it — but clearly that's an issue to be dealt with in terms of content in the future. And, of course, the last mile of bandwidth. As we identify those growth opportunities down below, audio and voice and video, there's going to be more need for greater bandwidth, and that point is made on this chart. Working from left to right, and bottom to top: e-mail and Web graphics already in place; however, we're going to have to expand the pipe as we get into audio and ultimately to full-motion video being available on the Internet, and that build out is occurring, but will take time.

Now, commercializing the Internet does make it the prototype for the information highway. This is the global and inexpensive connected computer network, and we think cybercommerce represents a great industry opportunity in terms of services for businesses and consumers, and we do see a very real future for cyberbanking and cyber-retailing.

In summary, we think that the Internet definitely affects industries on the cost and revenue side, and will increasingly do so as we produce quicker-paced information and more cost-efficient information. We do see the Web as the fourth utility for business and consumers; and we do see the companies playing a very key role, having done so early in identifying customers, packaging information, and creating critical mass of customer base.

Before we get into that graph, let me just say that as we've mentioned, the Internet has been embraced as an open network for research, communication and e-mail. The issues are straightforward regarding security, privacy and anonymity.

But how is Wall Street going to cope with these growth stories that are ahead of it? I vividly remember many of the potential investors asking us how to value a start-up company UUNet Technologies, which was at the time the first commercial-only Internet access provider to come to market — and UUNet had the obvious benefit of Microsoft backing, as they built out the infrastructure for the Microsoft Network. But how in the world were investors going to value a growth story in a fledgling industry, with potentially giant competitors such as AT&T and MCI poised into this market?

So, we thought about it — was there a traditional valuation measure to employ? Could you use a multiple of operating cash flow? There was no direct precedent. How about an earnings multiple? That was even tougher in the case of a company such as UUNet, which obviously had projected earnings a bit out, even though they have now met that projection early by a quarter. So, did you then assume a multiple of projected revenues? Even that was tough to distinguish. You have a huge growth in revenues, and the fact of the matter was that there was no benchmark that existed at the time.

Now, we at Goldman Sachs oftentimes draw value thoughts on technology growth stocks by reviewing the consensus for the projected compounded annual growth rate for the next three years of earnings. And we compare that rate oftentimes to a PE multiple, and we perform aggressive analyses on a number of technology areas that are in existence, and you'd be surprised at the remarkable similarity that exists between these three-year projected growth rates and the price earnings multiple that exists on that stock. But, of course, that didn't work in the Internet case, because we didn't have earnings.

On the other hand we could have suggested to investors that they value the investment on a discounted cash flow basis, computing venture capital type of risk and return into their

model. This is oftentimes used in a concept or idea-based stock offering. But it is a practice more commonly followed by early private investors, who often have different investment return objectives, greater returns, given the relative liquidity of private equity investment — clearly more risk. And also this valuation method is oftentimes used as a check against other valuation techniques to ensure reasonable investment objectives.

Now, as we looked at not only UUNet we looked at more subscriber-based companies such as an AOL, companies with belated earnings who we've seen in the past such as cable, paging or cellular businesses — they've often been able to rely on measures such as the number of existing subscribers, or in the case of cellular the potential customers or "pops," as a proxy for traditional valuation techniques. But the open nature of the Internet extends to competition, and there are no protected markets or monopolies as existed in cable or telephony, or even [inaudible], as existed in the case of early cellular. And thus prospective markets related to the Internet are harder to measure, given unfettered competition.

Now, I apologize for this graph a bit, because this is a very tough one to read. You'll have to take my word for it. But the third column from the left details equity market cap for a number of companies in the Internet, broadly speaking. We divided them by service companies, Internet access companies and software companies. Suffice to say we have AOL listed there, which is more than a four billion dollar equity market cap, as we speak. On the access side: UUNet, a billion and-a-half equity market cap in six months. And Netscape, of course, well more than three billion in equity market cap.

Without going into the individual multiples that appear on the page, the fact of the matter is that Wall Street values this industry on change, on growth. If you look at their three to five-year EPS growth rates, which is the column that appears to know the page, the PE multiples won't even match up with that growth rate. There are multiples of revenues, such as in the case of UUNet, thirty times projected '96 revenues. The fact of the matter is, however, that Wall Street continues to embrace the whole notion of the Internet and we see ample opportunity going forward for more of this type of valuation of the right idea and the right company.

Now, the commercial value of the Internet will become increasingly clear with a reliable and secure framework for financial transactions. Commercial interests can be extrapolated from the number of inquiries on any given Home Page or hits, as one form of success or a measure of success. But "needing convenience" will be the watchwords for consumers on the Net, and will determine the level of success in this type of market in the future. And we believe that there is a very healthy future for cybercommerce with many small companies. We think the sense of community that has already been developed on the Internet and among the service companies is continuing to grow rapidly. Thus, the first adopters of a new market and the financing techniques supporting them are already in place.

The next state, however, for cybercommerce will require broad acceptance by both merchant and buyers alike, born of necessity and convenience. A sense of community will enable both of these characteristics, and it is our bet that Wall Street will embrace this concept with the same passion, fervor and possibly even the same lofty market multiples that we've witnessed to date. Thanks.

[Tape change]

Timothy Duncan: Thank you, Bob. Our next speaker is Ollie Curme. Ollie is the Managing General Partner at Battery Ventures here in Boston, one of the medium venture capital firms in the country. Ollie is responsible for the firm's investments in the software and communications

areas, and he's here today to give the VCs, the venture capitalist's perspective on the industry and some of the issues that entrepreneurs in this industry are facing.

Oliver Curme: Thanks Tim. Can we have the first slide? There we go. My name's Ollie Curme. I'm a general partner, not yet the managing general partner.

We have slides. This isn't a computer show, it's a slide show, and so we can only point towards one screen. Sorry about that. . . I'm going to talk about the venture capital financing path, and in general how companies use venture capital to pummel their competition. But, before I get started, let me get a sense of your interests.

First off, how many people in the audience have used the Internet? Raise your hand, please. Very good. Very good. OK, I won't have to explain the Internet to you. Secondly, how many of you are interested in financing Internet businesses, raise your hand. Okay, for those of you who didn't raise your hand, this is a finance in Internet business, so you might want check and see if you're in the right place.

But how many of you are interested specifically in raising venture capital, raise your hand. Okay, well it looks like I've got quite a sales job to do, and I was a little bit afraid of this, so I've prepared an alternative presentation.

The story of George Hearst. How many of you know who George Hearst is? Good, nobody knows who George Hearst is. I will run quickly through his story, and I urge all of you to ask questions when I'm done.

What is the Internet? We all talk about it, we all use the analogies; it's hard to get up and say anything that hasn't been said before. However, I do have a favorite analogy that I use to describe the current Internet phase, beyond just mania, speculative frenzy, giant post office, data service, etc. To me the Internet is like the gold rush. Not just any gold rush, specifically the Nevada gold rush of 1859. To give you a little bit of history, there had been a previous gold rush in California in 1849, in Sacramento. But by 1859, a lot of the mines were played out and there was a huge glut of miners.

There were about 400,000 miners who were barely earning a living in the late 1850's and they were all desperate for work. One of these miners was Henry Comstock, he's the guy in the middle. In the early spring of 1859 Henry was digging in Mount Davidson, in Nevada, in an area that had already been prospected, when he hit a fabulous vein of gold which became known as the Comstock lode. This was the greatest single mineral strike in history, and this is a little painting of Ernst's rendition of what it was like when he hit the gold.

Here's a picture of Henry later on when he got rich and he could afford a top hat. Here's a picture of the mine; he had some innovative mining techniques.

Well, before you know it all the enterprising men in America took their burros and set off towards Nevada. They set out in small groups to find their fortunes, and there they are looking for gold. They formed big enterprising companies, and overnight towns sprang up in the wilderness and thriving cities appeared.

Now, I'm sure some of you are wondering what all this has to do with the Internet, so I've developed a slide that shows the parallels between 1859 and 1995. Here it is 136 years later, and to me it looks pretty similar. And recently a lot of the software markets have been played out. Big giants like Microsoft, and IBM buying up Lotus, have taken a lot of the fun out of the desktop market.

In the beginning of 1995 there were 6.5 million software developers in the United States and lots of them were hungry to find the next killer app. In 1859 we had prospectors; in 1995 we had — anybody want to hazard a guess? Preservatives. That was a trick question, sorry about that.

A rich strike was announced this year in May with PSI, and congratulations to my fellow panelist Bill Bunting, of Montgomery. This was quickly followed by NETCOM, UUNet and Spyglass. And then in July the investment glass hit the motherlode, Netscape. By now the Internet gold rush was in full swing.

In 1859, it was Pikes Peak or bust, today it is Internet or bust.

Here's an entrepreneur at 1959, and the same entrepreneur in 1995. For those of you who can't read that it's <http://www.money.com>. This graphic is courtesy of [inaudible] Group, I stole it from them — so much for intellectual property.

Here the choice claims that the entrepreneurs are going after: servers, browsers, security, authoring tools... However, guess what? These claims have already been staked out. Everybody, I mean every body has spotted the Internet opportunities and now all the big players are going after these markets. Media companies are all going after content. People like Silicon Graphics, 3D Visualization with VRML, and Dolby and Sun are trying to get a play at HTML offering tools. Visa and MasterCard and [inaudible] Netscape, Spyglass, and Netscape and browsers, RSA and Checkpoint Security, Cisco and BBM routers.

And then, of course, on the other side Microsoft has a huge appetite and is going after everything. So this brings us around to George Hearst. Remember him?

Hearst was the son of a Missouri farmer who came to California in 1850 to make his fortune. He worked unsuccessfully as a miner and then a storekeeper, and then in 1859 he was in Washo, California working a new mine when he heard about the Comstock find. He dropped everything and he headed to Comstock, where he cut a deal with one of Comstock's partners to acquire a 1/6 interest in the mine.

Now the price on the deal was \$3,000. George didn't have \$3,000, but George was smart enough to hightail it over to San Francisco and he raised the money in two weeks and hightailed it back to the mine.

It was a very early form of venture capital. It wasn't an institutional venture capital, but this guy needed money and he went out and he raised it quick. He hurried back with the money, and then the team used the money to start developing the mine. Within two months they parlayed the \$3,000 into \$90,000 of profit, taking out 38 tons of ore, which is about a 30 times return, and they plowed that back into mine development.

Now, I think you may see where I'm headed. It's towards a blatant commercial on the virtues of venture capital. But before I get to that, let me talk a little bit about Internet business models.

This is a slide that I stole from Michael Porter at the Harvard Business School. It describes the factors leading to industry computation. In the Internet, the threat of new entrance at the top is extremely high because the barriers to enter are so low. We've got 6.5 million software developers out there in the U.S.

The bargaining powers of buyers — you might read Internet surfers — is very high, because they can click in and out of your site in a manner of a second. The treatment of substitute products is also high, and the bargaining power of suppliers to the Internet business is very low. And this leads to extraordinary computation. It also leads to what I call the "generic Internet business model." This business model was pioneered by Netscape, but applies to many Internet Businesses. And basically, it's oriented towards a drive for market share. Market share above anything else, you offer extraordinary value in a product or service, you utilize the ultimate of price elasticity, which is you give the product away, and in return you build customers, you build brand, you might sell a little advertising, but the most important thing, is you try to build propitiatory standards.

And the reason for this business model is because the only way to get leverage in the Internet is in that box on the left-hand side, the bargaining power of suppliers. If you can get out

there and you can dominate an area and you can build in a propitiatory standard, then you've got leverage in terms of the bargaining power of suppliers.

There are a lot of examples of companies using this generic business model. On Web sites, there's companies like InfoSeek, ESPN, Quote.Com — we're investors in InfoSeek, it's an Internet search service. All of these companies just give away extraordinary content and they make it up, hopefully, on the advertiser.

SGI puts VRML into the public domain and tries to leverage up the propitiatory standard with VRML+. Sun with Java, Dolby Acrobat, are trying to leverage their way into HTML offering tools. Netscape gave away their *Mosaic* standard browser, and now they're building proprietary extensions.

Pipeline is a service provider, and you may have seen this ad. It's not free, but it's an extraordinary value; it's unlimited dial-up Internet access for \$20 a month, flat rate.

Here's another Michael Porter slide, and it shows that companies can make a very high return on investment. In general, by either being the market share leader, that's on the right-hand side, and dominating the market, or by following a niche market strategy.

The companies that I've talked about so far are all going for mass market share; however, it's not the only way to make money. There is some merit to owning a small niche in the market, and that's something that I'd encourage you all to think about. As a venture capitalist I'm really interested primarily in building huge companies that dominate a segment of the Internet business, not nice little small companies.

Okay, here's another quiz. What do all these companies have in common? They're big, successful Internet companies, and they all went public this year and they all lost a lot of money prior to going public. Why did they lose money? It's due to the generic Internet business model I just talked about. If you give extraordinary value away for free, you lose money.

Now, how did each of these companies finance their losses? That's right, each of these companies raised venture capital. And this brings me to the unabashed commercial.

What does raising venture capital get you? I've listed these six things. The top one is cash, and certainly the cash is very important, but cash is not the only reason to raise venture capital; in fact, if that's all you're interested in you should get it elsewhere.

Venture capital has worked very closely with our companies to recruit additional management to help position our companies in the market, to provide the resources in terms of cash and human resources to execute a crushing sales campaign. I mean, we are in the business of building small platoons into brigades, into armies, to go to war and to crush the competition. We work with our companies to establish strategic partnerships, and we help coach our companies through successful IPOs. These really are the factors that make venture capital a strategic weapon that companies use to fight their competition.

Now perhaps some of you are thinking, "well how hard is it to raise a bunch of capital?" This is a picture of the trek to the Yukon. Raising venture capital is not nearly as bad as the trek to the Yukon.

This is what it costs to raise venture capital. Just a couple of different things. In terms of time, generally it takes one to three months; if it takes a lot longer than three months you're doing something wrong, you've got the wrong pitch, you maybe shouldn't be raising venture capital.

The benefit, if you raise venture capital, after one to three months is that you get the money and you get the contacts for perhaps a six to twelve month acceleration into the market. So you get going on a faster track.

In terms of ownership, typically companies give out between 10% and 30% out of equity in their companies to the venture capitalists. So let's say 20% on average, although it varies somewhat.

What's the benefit to that? Well, if you give away 20% of your company and you get going in a market that's growing at 12% per month, or 400% per year, there's a six week payback. If you can get on a 400% growth curve six weeks faster, it's worth giving up 20% of your company to get there on that growth path. So given the extraordinary growth characteristics of the Internet, it's often worthwhile to give away a piece of the company to get going that much faster.

In terms of control, we never ask for control. You don't give control away when you raise venture money. You enter into a partnership with your venture capitalists, and the benefit is that we help build a team together and we build a group. If you want to dominate a company and run it all yourself, don't raise venture capital. But if you want to build an organization that transcends you, it's a good path.

One thing that I do want to emphasize is that it's a wonderful environment to be raising money in. The money flowing into venture capital funds have doubled from one and one-half billion dollars a year about five years ago to a little bit over three billion dollars a year these days.

Over the same period of time, over the same five years, valuations on private companies that venture capitalists have paid have doubled, from roughly ten million dollars to twenty million dollars for a small, rapidly-growing firm.

I read an article in Fortune Magazine awhile ago about Michael Milken, who was interviewed from his jail cell, and he was quoted as saying that anyone who is not raising equity in this current environment is crazy. Now, he may be a felon, but I think he's right.

Venture capital isn't the only source of capital for private companies you can still raise money from a variety of other sources. A "bootstrapping" is just what we call raising cash internally, and it makes sense for small niche markets, or even certain OEM markets that don't have a big marketing cost.

DDL, does anyone know what DDL is? It's a term of the art that we use in the industry it stands for doctors, dentists, lawyers — it stands for rich guys. Rich friends and family are a better way for most people to raise money than venture capital. Perhaps 10 to 100 times the amount of money is raised through DDL for start up companies in the U.S. than through institutional sources.

Corporate partnerships. This is a very fertile area, especially these days with programs with like AOL's Greenhouse that Mark Welsh talked about. Netscape is also doing interesting things.

In direct IPO, do not pass Go, do not raise venture money, just go directly to an IPO is a possibility for certain companies that are well-established. But it's interesting that only a very small percentage of Internet companies that have gone public had done it without venture capital first.

Okay, on the next three slides I'll quickly lay out a map of where I see some of the best business opportunities that are still wide open on the Internet. This is a map of the western mining district, and you can see the Comstock load over there in Nevada.

This graph is a little busy, but it's something that I got published in the *Red Herring*. It shows the Internet application layers on the Y axis, it's sort of like the [inaudible] stack where at the bottom you've got the infrastructure with T-1 lines and ISDN, and then you move up to routers and firewalls and intellectual property, and e-mail and browsers. And at the top you've got applications and content. And across the X axis you've got time. So this is a busy slide, but it shows the evolution of the Internet markets over time.

The upper levels are currently wide open. We see a lot of very big product opportunities along the top, things like music and video and various businesses, advertisement, entertainment, shopping. There's a lot of things that just haven't occurred in the upper levels.

And there's some very interesting niches in firewalls and intellectual property protection in some of the lower infrastructure areas.

Here's a second way of thinking about where the opportunities still remain for small companies, and basically it's a statement that every problem on the Web is an opportunity for a business. The Web is unorganized, so there's a huge market for search services. So, as I said, we've got an investment in InfoSeek, which is doing unbelievably well.

Security is a problem. A lot of opportunities in security.

Slow response time, there's a huge opportunity for compression and cable modems, which are two really, really hot markets.

Things like outages. Nobody has addressed moderating flow control software for routers. Cisco is starting to do something about it, but the center-connected "meshnetwork" is going to need a higher degree of organization than even the next generation IP can provide.

Boring pages, lack of multimedia — there's a lot of opportunities in audio/video software, VRML publishing and links with telephony. These are all wide open, and we're talking to a lot of interesting companies that are doing things like this.

Finally, we haven't talked about the impact of the Internet on non-Internet business. Here's four of our portfolio companies in four different areas that are extending their base products with Internet software and services. I mean, eventually the Internet is going to impact all business. And so we're looking to finance the business that can look out and see how the Web is going to effect their business and then apply that technology into a particular vertical market, like sales force automation or medical pay or provider networks.

Here's a quick plug for my firm. We are a leading firm that focuses on software and communications. But I think there are a lot of good firms out there, and if you are in the market to raise money, what you should do is go around and talk to some of the better firms in the market and choose a firm based on who you feel the most comfortable with, who you feel understands your business and would make a good business partner. Because it's really a partnership, it's not just a blown-off financial transaction.

Okay, I'm well within my time limit. There's only one thing I left out, which is George Hearst again. I wanted to complete his story.

After George got the Comstock load going with his venture capital he helped run the mine for a while, and then he sold his position out and made a small fortune. He retired for a little bit, but he later on turned his small fortune into a big fortune, when he developed the [Homestake] mine in South Dakota, which is the biggest gold mine in the United States. He went on to become a United States Senator from California, and he raised his son — you may have heard of him — William Randolph Hearst, who became the most powerful newspaperman in his time.

So there you have it. Raise venture capital and live happily ever after.

Timothy Duncan: We have heard some rumors in Boston that there may be some fidgeting activity in the high technology sector in Northern California. Until they start encroaching in the areas of proprietary word processing systems and micro-computers, we're not going to be too worried, though.

Our next speaker is from Northern California. Bill Bunting has been with Montgomery Securities for eight years, and he spent the last in Montgomery's private placement group focusing on technology. Prior to that he spent three years as a technology mergers and acquisitions banker, and two years in corporate finance, as both a generalist and technology banker. Bill has been involved in both the IPO and private placement for PSI Performance Systems International, and is now working on private placement with Concentric. His education includes an MBA from Harvard in 1987 and an Undergraduate degree from Stanford University.

William Bunting: It's a pleasure being here today. [I want to] just to give you a few of our insights about what's happening in the capital markets, both in the private arena — being late-stage institutional investments — and the public arena. But before I get started, I think it's important to sort of give a backdrop of what's happening in the capital markets away from just Internet financing. 1995 has really been an extraordinary year, particularly when compared to '94, which was by all comparisons a pretty flat year. This year the Dow is up 23%, NASDAQ is up about 35%. But what I think is more important for most of the people in this audience is an understanding about the outlook — will the good times continue, in other words. We are actually quite optimistic, despite this sort of healthy skepticism in the markets today about valuations.

When you look at the fundamentals driving the economy you see moderate growth, low inflation, the prospect that Washington is going to do something on the budget side, a stable dollar and lower interest rates today, all of which suggest that the outlook for investing is pretty good, particularly for financial assets. And I think particularly to the folks in this room, growth stocks are something that I think are going to be tremendous opportunity of looking in the future.

I'd like to talk about four things briefly, and one of the benefits — or curses, I guess — of being the fourth speaker in line is that some these topics have been covered by my distinguished panel members; but let me just see if I can move through this pretty efficiently.

First of all, a little bit of a backdrop of the technology markets and where those have been over the last two years. In 1995 we have a discussion about what's happened with the public markets, the financing for Internet-related companies, because it really has sort of burst onto the scene in a significant way this year. [Let's engage in] a brief discussion about what's happening, how investors are valuing company.

Robert made some pretty poignant comments about how many of the traditional methodologies don't really apply here, but notwithstanding that I would argue that our report cards actually are being built for the companies. Investors are just looking at others matrices, if you will. And then [I will] briefly touch on what's happening in the M&A marketplace.

This is a slide which depicts what's happened over the last 24 months with financing of technology companies.

In 1993, some 11.4 billion dollars were raised for companies in about 228 transactions. As you can see, in the fourth quarter it stepped up to around 5 billion dollars, and that was really when things really started to take off as far as the markets were concerned. This year, year-to-date through October, there has been about 20 billion dollars that's been raised, and the pace suggests that the fourth quarter will equal that of the third, making roughly 25 billion dollars, and probably it will be best year on record for financing growth companies. Feeding this growth has been the performance of the market underneath it, and investors keep coming back and asking for more because the returns are extraordinary.

This chart depicts the returns that investors have seen on three lines. It's a little difficult to read, but the bottom purple line is the S&P 400, the yellow is NASDAQ, and the top line is a composite of all of Montgomery's technology clients.

It begins in December of '93 and extends through to the present. I will focus my comments briefly on this year. Were you to invest a dollar in the S&P at the beginning of the S&P 400, you'd have about \$1.23 today in your pocket. The NASDAQ would give you about \$1.35, and the technology composite would give you about 2 bucks. You'd double it. In that, when compared to the S&P it's a 50% increase in rate of returns. That's why investors are coming back.

I would note that cautionary trend toward the top you see on the right; that curve is flattened, there has been a cyclical rotation out of technology stocks of recent date, primarily due to valuations, and we're going to have to see where things go. But as I indicated at the top I think the fundamentals for the economy are very strong, and I think investors are going to be continuing to fund these areas.

So in 1995, what are we seeing? I like to think of 1995 from the market standpoint as the first year of the Internet. Obviously there was some activity in the public markets prior to that, but if you were to look at a slide of who is involved in the public markets in 1994 it would be a much shorter list, and this is just a sampling of the companies. There is lots of ways to examine this, and cut and slice it and dice it, and I think that Bob did a pretty good job of kind of putting up the valuation parameters and how to organize things. You can look at them by software companies, networking companies, ISPs and the like. I tend to look at this from a different play, from trying to understand who investors are valuing this arena from the pure plays, companies like Netscape, Spyglass, PSI, EUNet and NETCOM, and those who I would argue are leveraging, for market and business reasons, a play on the Internet: [Harbinger], [Premanose], Checkfree, Dollarbox and the like.

One thing that I think everyone should keep in mind here is that while the universe is increasing, this year there are dozens of companies, and next year there will be multiples of that. The universe really is still very limited for public market investors, and I think that's one of the main reasons today that valuations are where they are for these companies. There is a scarcity, and you folks have a supply/demand advantage that you have in your back pocket right now. It's going to continue for awhile, but all good things will balance as far as the supply/demand is concerned in the future.

Just taking a look at the returns as each one of these segments is offered — most of these pretty quickly — but here we have the ISPs plus AOL, and obviously the returns in the red line are well in excess of what you would find in either the Dow or the NASDAQ this year. For the Internet software market, companies like Adobe, Firefox, etc. — again, well outpacing what the market has seen. Finally, with some folks that are related to the Internet, the equipment suppliers; people like Ascend, Cascade, Cisco, etc. have significantly outperformed the market this year.

So if we take a minute and we look at them just as select subset, what do you see here that has been the performance year-to-date? First of all you see that on average these companies have returned this year about 180% return to investors.

Compared with that technology index that I offered earlier, 200%, sounds like it's in line, but you got to keep in mind that these companies waited an average of being public six months, not the ten months that we have experienced so far; so if you kind of try to do an "apples-to-apples," you'd see that these companies' performance is up nearly about 60% over the tech index. And I think that is probably in line with the kind of risk/return profile, because many of these companies still are very young. They are losing money at present, and face a number of competitive threats that we discussed earlier.

So what are investors really trying to understand? Excuse me. One thing that I'd like to note here is that the amount of money that's been raised has been relatively small for financing. Today, as I mentioned, there is about 20 billion dollars which is being financed in public tech companies this year; for these five companies only 325 million has been offered to them. Their aggregate revenues are something less than 100 million dollars, and their market capitalizations are an extraordinary 5.9 billion dollars. So on a market value-to-revenue basis, it's a number that's off the chart. I call it "nosebleed territory." So you have to ask yourself the question: What are investors trying to understand, and how are they going about looking at these?

And I would say that where the Internet is today you can't use the traditional valuation matrices that we have talked about, that Bob alluded to these earlier. But what investors are doing is looking to have early evidence that the business model is in fact working. In the case of an Internet service provider, how fast is the Network being deployed? What is the cost of acquiring a subscriber? What is the performance of that network? And then there are the intangibles; is there any kind of independent or industry validation of a company? The best example here on the service provider side is obviously Microsoft's relationship with UUNet. UUNet is, by a couple measures, a smaller network than each of its purely public competitors, but its market capitalizations are a multiple of theirs, and that is because of potential that Microsoft is bringing to that equation.

Over on the software side it's the same sort of things you can do. On market acceptance, look at Netscape as a great example of where the user market really has embraced Netscape as a market leader. I'm not going to go so far as to say anything about a standard, but it's perceived in the public marketplace as being a market leader.

In this alliance and strategic relationship framework you can look at Spyglass, Microsoft, FTP and Open Market as other examples of independent verification.

The valuation matrix — I'm not going to dwell on this because I think Bob did a good job of touching on this earlier, just saying that none really apply. A few of them are starting to have a little bit of focus, and I guess I'd direct your attention on the service providers to the expected revenues. If you look at PSI and NETCOM you see that they are trading on '96 revenues in the four to four and a half times area; it's starting to coalesce on a number there, but because of the relationship that UUNet has they are trading at something in the order 13 times — so again, that strategic relationship and the potential that brings to it far outweighs the projected revenues, using that as a standard valuation matrix.

What's happening on the M&A front? I guess I would characterize it as one that is accelerating, and driven by strategic thinking as opposed to financial thinking at this point. These companies are jockeying to fill in key product services or technologies that they don't otherwise have. Valuations again are not being based on financial matrices; however, I would argue that there is an open issue here, which is that the companies can go out and make the acquisitions, and these oftentimes are done under what's called "purchase accounting." And when you're paying the kinds of valuations that you see for some of these transactions, a fair amount of goodwill is going to be created and recorded on the balance sheets of the acquiring companies.

I mentioned that investors are establishing report cards, and they are going to look over the succeeding quarters — and more likely years — to see how well that acquisition is being integrated. Is it creating enough value on an earnings basis to earn the goodwill and be an addition to the companies earning potential?

I'd like to have just a couple of thoughts here on this summer. First of all, the Internet is, as witnessed by the activity here today, the most exciting thing that I think that the public market has; if it's not the most exciting, it's certainly one of the most exciting opportunities that the public market is experiencing today, because it fundamentally offers a way to change the way we communicate with one another, and the way we do business and the cost structures associated with that.

That's why investors are paying the kinds of valuations that they are today for these companies. I think I've made the point that today the traditional valuation matrices do not apply, but they will. These companies all will go back, as Bob noted — they will be valued on an earnings basis, and they'll be valued relative to their growth rate. So if a company has a sustainable growth rate of 30% on a secular basis, its PE will be plus or minus 30 times forward earnings, and that's what we should expect in the long term.

The M&A arena is accelerating, it's very aggressive right now because it's strategic. Companies are filling in the holes in their product and service offering, but investors are taking note and will be looking to see how these acquisitions actually work out.

The question you ask yourself is: How long will the honeymoon last here for the Internet? And I think, really, that's a question to you. Investors establish report cards, as I have indicated, and as long as the companies that are in the public arena meet or exceed those valuation or those report cards, I think that there is going to be ample capital available for those companies. What will be the problem is when companies disappoint. And today, because of the massive amount of capital that's available and that is institutionally invested, it moves with lightning speed, faster than the Internet. It's amazing how fast people will move in and out of segments. So if you see a wholesale disappointment in a particular sector, don't be surprised if there is tremendous volatility in this arena as far as valuations are concerned.

Also, by the same token, if you see that companies are exceeding these expectations, I think you will find that these valuations are supported for the long term because of the tremendous opportunity that these companies and you folks represent to investors. Thanks very much.

[Timothy Duncan]: I think what we will do is take some questions for a few minutes and then take a break for about 15 minutes, and come back with the last three speakers for the afternoon. Any questions? Mark Walsh is the only guy that brought a checkbook today, and he has conveniently got up and left, he had to catch a plane.

M: Yeah, I have question. [Inaudible].

[Panel]: Well this is America, and it's all being valued by the markets out there. There are private markets as well as public markets. Your question is, how do the private markets value companies? There is a mania in the private markets just the same way there is in the public markets; there is a lot of money flowing into alternative assets and people are looking for quick returns, and there are a lot of people throwing money into private companies hoping that they'll just go public in six months and they'll make ten times on their money.

In the Internet segment, there has been an enormous increase in valuations over our traditional matrices. But it's a buyer and a seller, it's whatever makes sense, and we as a venture firm sometimes struggle to justify the valuations. Often we walk away from deals that are just great deals — but they're talking 100 million dollar valuations when we would normally put maybe 20 million dollar valuation on it.

[Timothy Duncan]: Any other questions before the break? Great. We'll pick it back up in about 15 minutes. Thanks.

[Tape change]

Timothy Duncan: Peter's company is a legal and consulting firm that helps both large and small companies establish strategic relationships in the on-line interactive and information services industries. His services include strategy, positioning, determining target partners, making contact and negotiating and structuring formal and informal relationship agreements. He's going to talk a little bit about what the Internet strategies are for the major on-line companies, how can Internet entrepreneurs position themselves to take advantage of these strategies, and what type of relationships are being structured in the current environment. Peter Marx.

Peter Marx: Thanks, Tim. As Tim said, basically I am in the business of helping companies get a strategy, basically figure out how alliances fit in that strategy — who should be the best partners, what type of deals would work with those partners — and help them structure that type of relationships and close the deals.

I'm going to do this from the point of view of kind a hypothetical case study. I'm taking something I'll be calling "*Tennis Universe* magazine" and I'll talk about their strategy and positioning, some of the potential partners they could be talking to, some selected strategic alliances that those partners have entered into, how to pick partners and how to structure relationships with them.

Tennis Universe magazine: What does it have? It's got two million readers, a recognized name, editorial and product databases and search software for feeds, and it's particularly tailored to the type of contents that they are interested in. There are strategies to become the place for tennis-related information, advertising, announcements, discussions and transactions. It's clearly a strategy that you can't fulfill if you're a print publication.

I've just selected a few potential partners, just to give you an idea of the way deals are being structured and how to think about it. Obviously there are many others, and these are the companies that I selected to look at for having *Tennis Universe* set up its own Web site.

[We'll] start with America Online. Now, in terms of acquisitions they've been very busy lately; one could call them an Internet mutual fund. Even if you don't think that their current model of doing business is going to survive, they're probably a good play on the Internet just because of the type of companies that they've been joining with. What is their strategy? Well, I view it as kind of an on-line community, and now they are linking into the Internet. I mentioned some of their game partnerships up there, because if *Tennis Universe* is in the tennis business it may be the people are going to set up on-line tennis games, or maybe the type of people that play tennis are going to be interested in on-line games more than your average person.

Some of their distribution agreements — basically about 20 computer companies that they've packaged their software in — kind of an answer to Microsoft putting Microsoft Network in Windows '95. The airplane [in this slide] is, as Mark mentioned earlier, the AOL airplane, and my thought here is that they could fly over the U.S. Open and drop floppy disks down to the people that are viewing that.

Content alliances. Well, first of all they are pushing very hard for exclusives. That's because they are concerned about everybody going to Microsoft Network and everybody going on to the Internet, I don't think that they've been that successful at it, but they have pushed hard on it. Some of the partners: Relevant, Reuters, *Time* and some of the sports ones that might fit in with a tennis publication. Obviously, if you're in the legal business or if you are in a different type of business you'd look at some of their other relationships to see how they are structuring things and whether it's the type of community that you think your business fits with. Mark talked about the Greenhouse; one of the Greenhouse partners is I-Golf, which would possibly seem to fit, with *Tennis Universe*.

How are they structuring their revenue sharing? Well, first of all, these vary a lot, but these are kind of numbers that are bandied about: they keep all of the basic monthly fee; with excess usage, they're giving the first numbers with the publisher — in this case the partner could be software — and they pay a bounty if new users come in because of your service. Ad revenue is 85/15, 90/10 on transactions, meaning if you're going to sell tennis racquets and people can order them on-line, but you obviously can't deliver them on-line, you're driven off-line — a 90/10 split.

The next potential partner that *Tennis Universe* could consider is Microsoft Network, and I look at it as a seamless Internet integration and the vehicle for electronic commerce. That's not real important today, but everybody thinks the big bucks are out there at some

point. They've been in the content business a long time, and are one of the leaders in the CD-ROM area. There's a big benefit in partnering with Windows '95, and the fact that Microsoft Network is bundled in it gives you a chance to hit a lot of people, 50 million potential users.

On the other hand, although we haven't heard much lately there is still the anti-trust questions that potentially could slow Microsoft down; if they do, they're not nearly as valuable a partner. Their revenue sharing numbers: 70/30, 80/20, and 95/5. Once again, these are just ballpark, and they're really negotiating all over the lot.

They're selling Web links, so you don't have to be on with them, you can just link them to your Web site. Then you have to decide: Is it better to have it from Microsoft, or *Pathfinder*, or somewhere else? Some of the alliances that they've got have individual links, local custom news providers.

TCI was an early investor, and they've got their Internet acquisitions. Some of the other partners [I've illustrated here] down below; they have a lot of content partners. Supposedly they are not coming on quite as quickly as they anticipated, but there is a long list.

Next company that *Tennis Universe* could consider is AT&T Interchange. There's a lot of benefits to partnering with them. AT&T has a lot of efforts going on. Business Network recently released a sister division to Interchange, and they've got partnerships with Netscape and BBN Planet for Internet access. They are also in the game business and soon they're going to be in the local service business. Currently AT&T always has to be considered as a partner.

The Interchange strategy is a brand publisher's platform. What I mean by that, is as opposed to America Online, where you kind of look like everybody else, is that the idea of Interchange is that you as a publisher can keep your identity, which is pretty important to a company like *Tennis Universe*. Some of the alliances they've got are with the *Washington Post* and [Gardner Groups]. Ziff Davis originally developed the Interchange, and part of the deal when they sold it to AT&T was that Ziff Davis would keep its computer publications, — *PC Computing* etc. — up on Interchange.

There are also some other newspapers, etc., and AT&T has said it doesn't plan to own content, which may be concern if you're worried about your partner competing with you; on the other hand, *Tennis Universe's* potential market is probably not big enough that AT&T is going to go after them anyhow. Bell revenue splits: 70/30. They take, once again, all the monthly fees, overtime connect by 95/5, ad revenues 85/15.

Once again, the publisher retains their brand identity. They evidently don't have Internet access, which is clearly a big "E" to this audience and to most people these days; they expect it in the summer of '96, which is kind of a lifetime in the current environment.

NYNEX. I mention them here as kind of representative of the Baby Bells. We all know they dominate voice telephone and they have great potential to become a significant Internet access player. ISDN, which has had significant potential for years, is much more important now that people [are] looking for more speed; and particularly with the broad networks this is going a little slower than everybody anticipated.

What their strategy is, heaven knows, and that pretty much goes for all seven of the Baby Bells. At any rate, they are not in any position now to play a significant role. They have to do some acquisitions, and time will tell what those are. They do have the money to do it, so somehow or other they say that they want to be player. One of the alliances they have done is InfoLook, which was a gateway service. [Judge Green], who manages the area which regulates the Baby Bells, gave them a little bit of permission to get in the information services business — but not enough to do anything meaningful, and that closed down, as did most of the Baby Bells' gateway services.

Our Dow Jones, a financial news wireless service, closed down [their Internet project]; and News Day was a home shopping experiment which didn't work out. They do have a relationship with Prodigy, both for directory information as well as for some network services.

Partnership with Bell Atlantic for wireless. They were very big in acquiring computer companies several years ago, but virtually all of them have been divested by now. They said they wanted to be in content, and their first major foray into this was a 1.2 billion investment in Viacom. Pretty much what they bought was a seat on the board and the ability to talk about synergy. We haven't seen much results on this so far, but they're not in battles with their partner, like U.S. West and Time Warner.

Bell Atlantic, Pac Tel, and Creative Artists have a 300 million dollar joint venture which kind of took — well, had bad news when Michael Ovitz went over to Disney, so this is probably not going to go too far, but the intent was a major play in content. Once again, this is entertainment content rather than information content.

The possibilities NYNEX had for *Tennis Universe* are really interesting. NYNEX Information Resources — this is a Yellow Pages subsidiary. It's a billion dollar business, very profitable, and they have a vast consumer information database; they have their sight set on electronic commerce, and this would certainly work well with *Tennis Universe* being a small subset of that. The strategy isn't totally clear today, and they really can't play the game until there is regulatory relief, but at least from this point of view they are a partner to be considered.

How about setting up your own Web site? Everybody here is probably doing it or thinking about it. It's a large audience, you have a lot more control, you got a managed infrastructure. You can go for all the revenue opportunities, and you dictate how. Challenges are security, [the fact that it] is a lot tougher than going with one of the proprietary services, there's a lot more development and marketing, which is a big deal.

Once you're out there *Tennis Universe* is a small player, so it's probably easier to communicate with the America Online membership than it is to communicate through marketing with everybody that's tapping into the Internet.

And then, finally, you have that risk that everybody has: are consumers going to pay for anything here? Is it all advertising-driven, and would that be enough to pay for this?

Some of the issues impacting the market positions of all these players impact whether you want to partner with them. Broadband network play probably will impact NYNEX, the [Artbox] and AT&T the most. These are going much slower than everybody thought, and it's a lot more expensive, a lot harder, and there are still more questions about who's going to pay to bill them.

Telecom deregulation. Everyday we read about the battles on this, and I think it's coming and that's going to certainly open up things for the Baby Bells, but it will take them time to get into the game.

Convergence. Who is going to be the winner? All these different industries merge together, and you want to partner with whoever is going to be the winner.

The Internet is a tool, certainly, and you can do anything; it will be shortly that you can do it on a proprietary service on the Web, but there is a lot of challenges in picking [which one] — who's got what, what's going to survive, and what's going to be the standards?

And I think extremely important is this Internet business model. A couple of people have mentioned that, and you can look at it different ways. To me there is no model. I assume it will evolve, but it's unclear what type of services work on the Internet, and whether anybody will pay. And if it's only advertising-driven, there is an awful lot of businesses that just won't work, I think.

Factors in picking among the partners: market reach, including the Internet access; and the revenue splits I think are less important in terms of partner picking, because I believe that despite the numbers I put up earlier they all negotiate, so that there are no fixed rules on that.

Time and financial investment, once again, are really not much different. All of them are ready and anxious to deal, except for NYNEX which can't, and that probably puts them out of the game.

Technological strength: they've all got strengths and weaknesses, and you have to take a look at what your business is. For *Tennis Universe* I put down that they have this search software, though it's probably not as sophisticated as anybody up there as a potential partner; on the other hand they have some things that fit in tennis, *Thesaurus* and so fourth, that are particularly geared to their business.

Infrastructure. Everybody is building and they infrastructure all these type of things. Some are a little better than others, and they'll all get there, I would think, pretty quickly in order to handle these type of issues.

The payment one is a little harder on the Internet, as we all know.

Structuring the relationships. What counts? Some of the key issues are operational, like any joint venture alliance.

Cultural fit, I think, is the first thing. If you walk in and you start negotiating and you don't feel comfortable with the people, regardless of the strategy it probably won't work out for some reason or other, and I think that's a lot of the problems that the Baby Bells are having with their media partners. There is just no cultural fit. My feeling is that the most significant expense by far is to whether people are capable of doing the marketing you need — who's going to pay for what.

Development. On the proprietary services, just a little bit development is needed as opposed to on the Internet, and it's probably less important in marketing.

Security is a big issue; on the Internet less so, all the services are probably pretty secure.

Financial royalty splits. Microsoft made a great to-do over the fact that they had turned the equation around when they were coming out with Microsoft Network. Basically they said, "hey we're going from you the content owner getting 20% and we'll take 80% reversing that to 80/20, 70/30, so you got to make a lot of money on Microsoft Network." I don't know where they get their figures from, I don't believe that it's been anything like that. I think that, first of all, if you look at the commercial side, the content owners are far bigger than the people that are distributors, and obviously if you look at Dow Jones, Reuters, Dun and Bradstreet, they are far bigger than Lexis/Nexis, Dialogue or any other consumer things, and basically the splits have been negotiated on the basis of bargaining power.

I think the splits have been pretty good for the content owners. The mass market is so new, for anybody to say "this is the formula" — well there hasn't been any formula, it hasn't been around for long enough for there to be any significant splits, and they've always been negotiated and they still are today, so it's nothing like the content owner is taking 20% of the total revenue package on Microsoft Network. So I think it's very much and always has been heavily negotiated, and will continue to be for the foreseeable future.

Expenses. As I said, I think marketing is the only one you really have to worry about, how that's going to be shared.

What's going to be the biggie? Legal. A lot of people we have here will talk about legal, maybe not in this context, maybe contracts — although on the Internet there may not be as many contracts as we had in other arenas, but that is part of it. Who's got the customer connection, who's got the identity, are very important to structure a deal, so that you continue to own your customers.

Protecting intellectual property is a big issue. Everybody — and it doesn't matter where you are — I think that unless you have content or a service that is constantly updated at low cost per unit, intellectual properties continue to be a problem, and I don't think encryption and a lot of other schemes are going to work for quite a while. So people are a little bit shifting the type of business that they are putting out there in order to take this into consideration, kind of for better or for worse. The business models are shifting in order to face this problem.

Exclusivity. I think the last major exclusive deal was the *New York Times* did a long-term exclusive with Lexis-Nexis with regard to its historical information. It was viewed by most people as a disaster for *New York Times* when Lexis/Nexis was sold out of the air; they terminated that, it was the first opportunity they had. I don't think we are going to see anymore major exclusives of that sort, and I would certainly say for *Tennis Universe*, don't enter into an exclusive despite the fact that Microsoft Network would like you to, AOL would like you to. On the other hand maybe you can tell me you won't go on Microsoft Network for awhile, and that may be sufficient.

Who is responsible for these issues of liability, privacy, pornography? We're reading all these interesting cases in the paper, but the issue is not when the distributor or whether the owner of the service has done something wrong. It's more of the Prodigy and Stratton-Oakmont, where some third party has done something wrong. How do you figure out between the two of you that this is worth negotiating on? It's a very hard negotiation, but the stakes are very large, and we're going to see a lot litigation in this area. I'd say deals used to be three year terms with year-to-year extensions; I think they are getting shorter and shorter, just because everything is moving so fast. Nobody wants to tie themselves up very long.

Some conclusions: I think set up your own Web site. *Tennis Universe* is a small player but everybody is capable of doing it today. Perhaps take one partner among these. NYNEX is not a possibility today. Other than the Internet issue, probably AT&T interchange would be a real good partner for *Tennis Universe*. Microsoft is certainly going to be a big player, America Online is already there. For somebody like *Tennis Universe* that isn't there already, it's probably pretty good to tap in to AOL; you have two and a half million users and it's growing fast, and just tell them: "Hey, we won't go on Microsoft Network for a year, but we have to have our own Web page," and in effect you do your market research there. If it's a good business you stay there, if not then you just go to your Web page and maybe another distributor.

I don't think you have the time or the money to deal with more than that. Some of the deal points that I'd negotiate with them is the non-exclusive, obviously the ability to set your prices — a lot easier on your Web site than otherwise, and pretty much easier with AT&T Interchange than it would be with AOL, because they've got their own structure. Keep a fair share of the revenues, what ever the heck that means. I guess my point here is that it's negotiable; you don't have to take any formula, you have to set up your own business motto and what's going to work for you, and I think you can negotiate to get that with any of the players. Maintain the primary customer contact; as I was saying before, once again it's easier with Interchange than some of the others.

You've got it totally on your Web site, so protect your brand identity. Once again, a player *Tennis Universe* has to do that. If you're somebody in a different type of business maybe you don't care, but I would say for this type of a partner you have to insist that that's the way it is, and anything a partner can do to help you maintain is really a critical bargaining point. Thank you.

[Panel]: I think anybody that reads the newspaper and is interested in the Internet has had a hard time, or would have a hard time not knowing who Forrester Research is. As a matter of fact I had this fantasy that if Jesus Christ returned to the planet and decided to communicate to

people over the Internet, you'd read in the *New York Times* the next day: "Jesus Christ returns to planet, communicates with people through Internet," and the next line would be "According to [Maria Madow and Listed] Forrester Research this was the first time a spiritual leader had decided to use the Internet for..."

[Panel]: We have been briefed on that, by the way.

[Panel]: But Emily Green is here today and Emily is with Forrester. She is a senior analyst there. She is part the group that looks at high-tech consumer markets, and to that end she follows the services in the Internet, and she is probably the only speaker here today with movie credits. She is an engineer and spent the early part of her career out in Hollywood designing special effects and to the effects for movies like *2010*, *Star Fighter* and *Ice Pirates*, so she is going to present an interesting perspective of our business. Emily Green.

Emily Green: Hello. Do you hear me, can you hear me? Yes, okay. Hi, thanks for inviting for to join you, this is a great group of people to be a speaker amongst. I'm not sure if that was the right preposition. Am I standing in front of everybody's view, can you see me? Yes, you can see, I know you can see. Anybody that want to move? No? Okay.

All right. As Tim told you I am an analyst with Forrester Research. I'm in the group called "People and Technology Strategies." That's kind of a mouthful, but we look at high-tech in the consumer markets, we cover the ad and the Internet world, but [the Internet world is] where I spend most of my time. To say I'm one of the only — well, at least a half a dozen analysts at Forrester look at the space, and none of us can see all of it at once, as hard as we try. But I think all of us would agree that being analysts we do know everything there is to know about this space and we have all the answers. I could definitely make it my life's work to answer phone calls from people who call me up and say "I'm going to start a business, and what should I do?" So it seems somewhat appropriate that I got asked to speak on the topic of "How do you make money on the Internet's space?"

Again, I can't take the whole Internet as my topic, partly because of the limits of time, so I'm going to pick out a couple areas where I think I can share some insight with you and see if I can tell you anything you don't know already. To do that I'm going to draw on some research that we've done recently, some of that I led myself and some done by other folks. Just to sort of frame the discussion, there is probably two sections to this talk. One is to at least get you to look at it from my point of view, so even if you don't agree with the landscape at least you know what my perspective is.

So we'll do a bit of a level-set first, and then to try and talk about where the return on investment can actually come from. For those of you who are not looking at starting you businesses or trying to get your own businesses off, [the question is]: Are there any more Netscapes out there? I don't know if I can answer that question, but I'll try.

Okay, so in terms of just doing a level-set here... Oh, yes, this is my disclaimer. I think we are going to talk about this question a lot, and I don't want to be associated with the idea that Forrester's whole point of view about the Internet is that it's a way to make money. There are a lot of things that you can do with the Internet. I just want you to know that I know that. I get a lot of questions on panels afterwards like "don't you understand all the other things you can do with the Internet besides sell advertising?" And yes, I do understand that, and that's not the subject of this talk. I just want to say that, to sort of put a fence around the context here. So there are a lot of other reasons to get [involved], there are a lot businesses that have a phenomenal opportunity to reach their customers or their suppliers through the Internet, and I'm not going to talk about it.

All right, a definition first. I'm just going to be economical and say — and please understand that I'm talking about the Internet, and I'm also talking about proprietary service. I'm talking about the wired world.

I'll just try and give you quick characterizations. I think there is an opportunity to do a "Leonard Pinth Garnell," the character from Saturday Night Live, who used to do a little segment on bad theater. I think in terms of looking at the content in the past, in both services and the Internet, we had a lot of bad stuff. We had bad brochures, bad catalogues and bad magazines — that is, adaptations of content from other media. I'm sure anybody who spent any time in this space has a well-thumbed copy of Marshal McLuhans' *The Medium Is The Message* book by [your night stand]. You look at this nightly before you go to bed, right? One of the things that he said was that in the beginning new media always looks like old media, and I think that's an example of what we've been seeing. Everybody's idea of what content should be is something that was borrowed from television or print and — "re-purposed" is the euphemism we use — putting it up on the Web, for instance.

Users. Definitely, the user probably should be visitors or subscribers, the people that you can reach through this medium. We definitely have an earlier adopter profile. Yeah, there are eight million American consumers that you can reach through the services on the Internet, but they have a narrow demographic. That's not a value judgment; that could be good or bad, depending on who you are. If you are the medium and you want to reach people who are 25 to 45, predominantly male, high income, users of technology, have PC, have high-end PCs at home, upgrade their PCs regularly, that's a great demographic segment. But if you're Neiman and Marcus it's not such a great demographic segment, because you need reach women, you need to reach people who aren't technically savvy.

So the narrow demographic of the people that you can reach through this in the past has been part of the problem, and also part of the opportunity for many businesses. In terms of the networks themselves, there was clear distinction between a proprietary commercial service like CompuServe or America Online, or Prodigy or Delphi or whatever. Consumers were forced to choose between one or the other of the on-line services, and services spend a lot of energy very carefully positioning themselves as "not the Internet." "We're not the Internet, we're more secure. We're not the Internet, we're more family friendly. We're not the Internet, we're easier to use. We're not the Internet, we're not so confusing." That's the old way, right? That's the way it used to be.

So things have changed a lot in the past year I would say, talking about the presence, basically just limiting ourselves to 1995. In the area of content I see a lot of reasons to hope for good things ahead. I see lots of interesting content that has been innovated or created specifically for this medium. I didn't hear Mark Walsh's presentation from AOL but he probably mentioned Motley Fools. Was anybody here to listen to Mark, did he talk about Motley Fools?

[Panel]: Not today.

Emily Green: No he didn't. I can't believe he passed up that opportunity. It's the first time I've ever gone on a panel with Mark where he didn't mention Motley Fools. Motley Fools is a very interesting space on America Online. It's not content — well, it is kind of content, it's a space where if you have an interest in personal finance and investments in the stock market you can go there and you can follow a portfolio that they've created, you can engage in conversations with other AOL subscribers about the various stocks that they pick. You can join moderated discussions about other segments of the stock market, and it's an experience that is not an adaptation of *Money* magazine. It's not an adaptation of Louis [Rukeyser's] *Wall Street Week*, it's its own thing created expressly for that medium.

In the Web there are two examples that I love, that I look at periodically, and one is the *Discovery Channel*. Does anybody look at that? Yeah, do you like it? I think it's an interesting place because they're creating content that is specifically for the Web. Yeah, they are affiliated with the network *Discovery Channel*, but these are the people that are cast with creating content for the Web space are separate.

For instance they are about to launch a new... This is such a stretch for words sometimes in this space — I always want to say “space and area,” — a new part of their Web site where they're going to be sharing information about a documentary that will not be seen on the television networks until a year from now. But meanwhile the community can watch the research that the scientists are doing unfold. As it happens, they engage in a dialogue with the researchers themselves.

Another interesting example on the Web is The Spot, has anybody seen the spot? It's interesting because it's not a TV show, but it's kind of like a *Melrose Place* of the Web. But it's not *Melrose Place*, it's a different experience. It's “multi-threaded episodic content,” I guess, for one of the better terms. But the idea of unique content is being created, and I think that's promising.

Obviously in the area of users there has been a phenomenal amount of growth, partly because of the blanket strategy that AOL has with the sketch but also because of the enormous amount of information that consumers have access to now in the press and television, fueled partly by organizations like Forrester Research. But there has also been a good deal of churn, at least from the consumer point of view. Consumers get on line and get on the Internet, and try and figure out what's good about it after they've been told by their neighbors or their brothers-in-law to check it out. They get on and try to understand how it's useful to them. How does this fit into my life? The same way a newspaper fits into my life? What's the benefit to me? And we see a lot of churn, and we suspect that's because people haven't yet understood what the utility is. There is a novelty factor, but the novelty wears off, the bills start to come, and they say “Ah, I'm not sure it's really worth the money.” So it's a problem.

In the Network area the services have gotten religion as a result of content, and consumers are starting to move toward the Web, as the Web is the easier place to put content up. And as content providers they can have more control, and can look like the way they want to look — instead of the way America Online wants them to look — and they can experiment with various models for revenue by charging fees or controlling their advertising.

Content is going that way; consumers see that that's where the really cool stuff must be, and so the services have not being able to afford to continue to make themselves distinct from that space. Now the services in effect are saying, “we're your gateway to the Internet, we're your characterization of the Internet, we'll help you figure out what's good, what's decent, what's valuable on the Internet.”

Of course, all of this is causing the Internet itself to wrestle with a lot of maturation problems like security, upload of popular sites, quality of service and the phenomenal appetite that surfers have for what people call “eye-candy,” and that is the multimedia sound and graphic stuff.

We're trying to figure out how to adapt the Internet to meet those appetites. So what's ahead — I'm not going to probably stun you with these revelations — but I think we haven't yet even scratched the surface in terms of interesting content. That's maybe a cop out, but again if I knew what the really great idea was I wouldn't be forceful, maybe I would be doing it. But I think that we're going to be laughing a couple years from now that the idea that the predominant content model for the WorldWide Web is magazine content. I think that's going to seem laughable. So I think that people are going to be coming up with some very interesting ideas, and I'm sure Mark mentioned Greenhouse as a place where they're trying to foster that.

And they're not alone in that area; all the of services and all of the large Web sites are fanatically trying to understand where the really creative content is going to come from.

Users. We definitely see an opportunity, we see a trend that's reassuring for all those people that want to reach something beyond the current narrow demographic. Definitely more women are coming, more children are coming, people who are less technically savvy are coming, and you're getting a little a bit of a spread in income in terms of consumer demographics. In the Network we see a lot of upheaval ahead, and we see that the networks are ultimately going to look lot like the long distance market.

Two reasons. One is we just don't think that a lot of these business will be able to withstand the downward pricing pressure that's created by the competition. There is the commoditization of access to the Internet that's upon us, and then what starts to matter in terms of being in that business is scales, how big you can be and how far you can drive your cost down. The other reason it's going to look like the long distance service is that the long distance players are going to be pretty heavy hitters in this space. AT&T and MCI are already starting to move in that area. So there will be lots of acquisitions and consolidations as that part of the market gets squeezed.

I just want to conclude this level-set with a couple Forrester figures which are freely quoted in everybody else's presentation for their own board of directors, and show up in business plans all over the world. These are relatively recent numbers that we just put together in September for a research report that we did called "The Internet Economy." Everybody is craning... Why don't we read the numbers out loud?

Oh, push it up, okay. Two charts here. One is a characterization of the penetration of PCs and access to the Internet in U.S. households in 1995 and the same assessment in the year 2000. Right now there are about 96 million U.S. households, so it's almost one for one year. Our numbers for penetration of home PCs in the United States are something like 24 million, which adds to about 28%, and our number on Internet access in U.S. households about 5.6 million, something like that. I'll tell you that these numbers tend to be very conservative compared to other figures; we see a lot of PC penetration numbers that are a lot higher. We actually account in our PC models for the retirement of machines. We are starting to see people on their second and third generations of computers, and we haven't seen anybody else's forecast that really takes that into account.

I'd just like to mention that because that tends to come up as a question pretty often. What we see in the opportunity for penetration and consumer space over the next five years is pretty strong, although we are certainly going to be far shorter for ubiquity, which is a nasty assumption I see in a lot people's pointers. We still think that by the year 2000 Internet on-line service access is likely to be below 25% in U.S. households. I think that's maybe a bit of cold water for a lot of people.

M: [inaudible]

Emily Green: Do I have — the question was, do I have a volume of [pillar] houses on the Internet? We have that number prior to the model that drove this chart, and I don't have it at my fingertips. So if you want to give me a card, we can talk later.

Okay, and one more chart and then I'm going to move and talk about the business model stuff. Also from the same analysis, this is our projection for the shift in sex and age of on-line users. In 1995 it's our assessment that overall men make up about 74% of consumers accessing the Internet and the on-line services. Now, that's a composite number, and what's very interesting it that it is being played up very heavily by some of the on-line services, and their numbers vary quite a bit from that.

For instance Prodigy has, I think, 42% women. That's very high, it's the highest of the on-line services as far as I know. Right now the numbers we have for children — that is, children under 17, under 18, 17 and under — about 4%. Our projection is that in 5 years we will see a shift where adult men will drop to about 50%, with the remainder split about 30% or 33% women and the remainder children. So there are growth opportunities in both women and children.

Now, return on investments... Here are some things I'm going to talk about and some other things I'm not going to talk about. I'm going to do a real brush on the infrastructure opportunity — that is, making money, as probably everybody in this room wants to do. So, you're all going to leave as soon as I'm done with that slide, right?

Routers, servers, browsers, that market. Selling equipment or services that are allowing this whole market to expand. I'm going to talk about revenue opportunities in content and in retail because that's part of what I personally track. There are a number of other revenue opportunities that I'm not going to talk about; I just want to make sure you understand that I'm not assuming responsibility to describe the entire universe of revenue opportunities.

Okay, infrastructure. What I'm going to do is give you some numbers that are part of a Forrester study done by another group inside Forrester; but before I do that I'll just frame it a little bit. We looked at the whole infrastructure opportunity in four sections: access, that's the Internet service provider business; hardware, that's selling iron to fuel the growth in that service; software, that's Web servers, Web clients, and tools; and services — sorry for the typo — and that's helping build your Web site, hosting a Web site, that sort of thing.

People are struggling to see. All right, you want me to read this off? That's rule number one in presentation school, never read your slide. Fortunately my presentation instructor is not here, so...

Access. We think there is a lot of up-side left in the Internet service provider business, but as I said I think it's going to be very competitive — which is not say that there is not a lot of dollars there, as small and medium-sized businesses come in to the Internet.

Hardware is definitely riding on the coattails of access. As more people come on board there are huge opportunities, primarily in servers and modems and other interface equipment.

Software. Yeah, there's opportunity there, but I think it's going to be very, very bloody. We see waves of features starting to hit and that really devalues the price of the software. We spoke earlier about the models of delivering excellent functionality for free, and it's tough to make a business on that. A professor of mine once called that "selling at a loss and making it up on volume."

All right, service opportunity, I think, will be relatively short-lived. I think a lot of people are using outside services because they can't find the skill set in-house or they can't hire the skill set because they are making too much money as consultants. I also think that there is a lot of upheaval in the tools area right now.

If you're going to build your own Web site development team, what set of skills would you want to hire? Well, this week it's HTML, next week it's — what? Who knows? As tool site jobs come out and are replaced by even more competitive offerings, it's going to be hard to pick a target in terms of equipping an internal organization. But I think that ultimately the tools issue will settle out, more people will get conversant with those tools, and the opportunity for consulting and other kinds of services will diminish over time. I'm not really relishing that. So here is the all important market size chart for those four segments, and since this is delightfully unencumbered by actual numbers...

[Tape change]

Emily Green: ...The hardware market we size in '95 at 50 million dollars, which is really small but growing by 2000 to 2.2 billion.

Services market is at 30 million in '95 going to 1.6 billion in the year 2000.

Access market we sized at 123 million — here, this doesn't include on-line services, because that's about 700 or 800 million on itself; this is just in-and-out access — 123 million in '95 and about 4.2 billion in the year 2000.

Software about 143 million now, expanding to about 2.8 billion by the year 2000.

Overall these four segments comprise about 350 million and about 11 billion dollars in the year 2000. Again, I think these are characteristic of other [inaudible] numbers, and they are relatively conservative relative to other projections I've seen.

M: [inaudible]

Emily Green: Yes, yes. Okay.

M: [inaudible]

Emily Green: We did split it in the model that underpins this chart, but I don't have the numbers with me. There is a very elaborate model that goes into this. Yeah, another question?

M: [inaudible]

Emily Green: That's an excellent question, I'll repeat it. The question is, does this model count or project the opportunity for just those components of the Internet itself outside the various corporate firewalls, or does it really reach through the firewall? And it does not reach through the firewall. This is just the Internet itself.

Yeah, one more question and then I'm going to move on.

M: [inaudible]

Emily Green: The question is, can I expend on the projection for access? I don't know the size of the long distance telephone market, but it's quite large. I didn't mean to imply that there is no revenue opportunity there, just that the competitive scenario is — what, AT&T has about 60%, MCI has about 30%, and Sprint and the others have the remaining 10%. It's just that there is not room for a lot of different competitors in the model. That's the analogy I was drawing.

I don't think that's saying it's going to look like long distance diminishes the revenue opportunity there. Okay.

All right, I'm going to move on; any other questions I can take afterwards.

All right, so I wanted to talk about content revenue opportunities. I wanted to sort of dispatch the infrastructure discussion pretty quickly. Again, we've done a lot of research in this area, and there are a lot of Forrester people that know a lot about it, so I'll be happy to point you in the right direction if you need more information.

Content. We recently looked at how to make money as a content provider. As a publisher for instance, how can you make money with your content in the WorldWide Web?

There are three sources for revenue for content providers: advertising, subscriptions, and fees paid — subscriptions and transactions, sorry, I'm going to lump those together — and fees paid to the content provider by, for instance, the on-line service in order to have the content, making the content available. We've been very bearish on the revenue opportunity for content in the on-line servers. We think that very few of them are really recognizing anything

other than a drop in the bucket relative to their expense to do this, and all it's providing is an exposure to the kinds of people they can reach, learning about the kinds of problems they have to solve and how to adapt their content, and the money that they can recognize through the payments of people like America Online just going towards partially offsetting their investment. But there is no big opportunity depending on America Online or Microsoft to pay you for your content. And again, no opportunity in the Web, right? There is nobody to pay you in that model.

The subscription and transaction model. We're not opportunistic about that. We don't think that that's a really good opportunity — again, I'm talking about consumers — all except the business model. But I think consumers in general are much more familiar with media that subsidizes its cost through advertising. And though lots of people like the public television model, when push comes to shove — and right now here in Boston WGBH is doing its annual fund drive, it's driving me crazy, I'm not listening to the station this week because I can't stand it — most consumers, when given the choice, will opt for content that's subsidized by somebody else in order to keep their cost low. And that of newspaper, television and every other media that they know and love. There definitely is a modest opportunity for people that have a very focused Internet goal, but in general we discourage people from trying to make a go on the subscription model.

We were talking about *Discovery Online* earlier; they came out with their Web site and announced that they were going to have the Web site available for anybody for 90 days, and then starting September 1st they were going to start to charge for it. They were going to have a subscription model and it was going to be, I don't know, \$24 a year or something like that. Well, they haven't really gotten around to implementing that, they [inaudible] started charging. I think their sense is that they're not sure that they can make the case to the individual visitor that that's a viable model. I think they are really interested in building a community right now, and that's another reason not to implement subscriptions. What you really want to do is build your audience.

So where does that lead? Advertising, right? We did an analysis, and this is going to be hard to see...

M: [inaudible]

Emily Green: All right, does that help? Advertising is the real revenue opportunity for content providers on the Internet; according to our figure, something like 2.6 billion dollars by the year 2000. Again, just to frame this, this is where we can find revenue, what the source of revenue will be for content providers in the on-line space.

Access fees from services and subscriptions and transactions revenue are extremely limited. It really is advertising. And when I talk about this to people who aren't maybe as wired as the audience, people bring up the Prodigy example of this sort of ticker-tape at the bottom of the screen; and advertising is undergoing a phenomenal transformation, and that's another presentation in itself.

But advertising as we know it is changing. Somebody earlier used the word "edutainment," and what we've been talking about is "advertainment." It's the same attempt to say that advertisers are trying to explore methods of making their advertising more appetizing, more interesting to people, and you have to think about the evolution of that. We're not talking about 2.6 billion dollars worth electronic billboard; we're talking about people who really figure out how to make this a way to connect with their consumers.

Okay, so I said I would talk about — oops, I have one more slide on content.

Is this a crazy forecast? Some people have said this is crazy, 2.6 billion dollars is an enormous number, and I just wanted to give you something to compare it to. Forrester's own projections about the number of consumers reachable in the on-line space by the year 2000 is something like 27 million. That means that we're talking about \$100 per capita by the year 2000 of advertising expenditure. Compared to what is expended in the print world in order to reach consumers, I mean the TV world, it's quite modest. So I just wanted to give you that context.

M: Is that an annual number?

Emily Green: Yes, that's annual, thanks.

Okay, now I'm going to talk about retail for the charge [inaudible]. We've looked at retail very recently and the best word for it, if you try to sum up the best opportunity to sell things to people through the on-line media, is it's experimental. Some people are making a big go of it and other people went in with huge expectations and are sinking and getting out fast, and I would say the predominant reality is that people that got in are slugging it out and aren't really making anything happen yet, but they realize that the opportunity now is to experiment, to understand, and if they can hang in long enough the up-side will be there. If you're successful right now selling on-line, it's because you have a product that's very well suited to the demographics.

I mentioned that it's a narrow demographic, it's predominantly male and they tend to be high-tech obviously, so the kinds of things that are selling well on-line are hardware and software. Buy a new computer, fire it up, get on-line and buy some more software for your computer. Other things that are selling well are what I call "bit" products. Anything that can be reduced to bits in some fashion seems to be a very close, a very easy step from the on-line medium itself, and that is books, music, CDs, videotapes, etc. These are also things that people are already comfortable with not necessarily going into a store to buy. And these are things that can be sampled on line; there are publishers that are sampling chapters of their books and tables of contents. You can access bits of soundtracks, and I think we're going to see lots more of that. And there are software organizations, people selling software that are actually delivering the software on-line. So those kinds of things are doing well.

The other thing that's important right now is an attempt to understand the best way to deliver value to the consumer, and that is an attempt to shortchange an enormous discussion of the fact that the consumer has lots of other opportunities to buy these things, these are products that they can buy elsewhere, frequently through direct-mail, almost always through going to an actual store. You have to understand exactly why they should buy it on-line, and you can't say it's because it's easier, because most of the time the truth is it's not easier to buy it on-line. It's not much fun after you've done it the first time.

So after they've gotten beyond the novelty of being able to send flowers to mom from the computer, you have to understand exactly why they are going to want to do it with you. Is it because — as in the case of Software.Net, the people that sell software on-line — is it because they've managed to capture a lot of your shopping experience in one site, that you can look at product reviews, you can access some manufacturer's pages, you can get on a bulletin board and you can talk to other people that have used it, and you can actually take delivery of the product? They've corralled the entire shopping experience for you at that site. Or is it because it's cheaper? There are not a lot of people yet that are offering products for less on the Internet, although I think ultimately that will change.

What's the point? There are a lot of people who just get on there and assume that it's the "build a better mousetrap" myth, that people assume that the world is going to beat the path to their door just because you can now buy diapers on the Internet, which you can. But

you know, it's not happening in a big way yet. What needs to happen for retail to be a successful business opportunity for people is this: the customer base really needs to diversify beyond the demographic we have now. I mean, the Neiman Marcus' of the world would love to use this as an opportunity; they see direct-mail, paper and postage costs [going] through the roof — it costs them a lot to put catalogs through the mail, and they realize that there is a developing backlash to junkmail, and consumers don't want to be bombarded with stuff. They would love to understand that this is the way that they can reach consumers.

But what needs to happen, of course, is a much bigger penetration into the consumer space. The shopping experience itself has to get better; it's pretty flat right now, it's not really as nice as looking at an actual catalog. And somebody said to me, "If you want a portable, random access, multimedia shopping experience it's a catalog, it's not the Internet or the Web at all." So you need to have more multimedia in the space, and that means better tools for developing those Web shopping sites, and it demands more bandwidth to the consumers so it really is the thing to watch as the pipeline to the consumers home expands. Those things will happen over time, but they're not there yet.

The other thing I like to talk about, that hasn't really happened yet, is a sense in the retailers of what merchandising means in this space.

Anybody that spent a lot of time in merchandising in the stores, in department stores, can tell you about all the research that they've done where they positioned people in the aisles to watch where people go as they wind their way through a department store. Grocery stores discuss where certain "for sale" products are going to be positioned, on which end-cap, to get your attention as you go down the aisle with your cart. There is no consensus yet about the equivalent of what an end-cap is in the on-line merchandising world. What's the value of a particular space on a page? Somebody back there really wants to ask a question.

M: [inaudible]

[Panel]: I think advertisers will pay big dollars for basically real-time, on-line demographic information about the information about that person who bought the white gloves.

M: [inaudible]

[Timothy Duncan]: Why don't let Emily finish up, and then we can introduce the question.

Emily Green: I agree with you, I think that "target market" may be the short way to encapsulate what you were saying. The opportunity is to really make a rightful shot to your prospect and understand exactly what they want, build that relationship, cultivate it and focus on trying to understand their specific interest. "I'm never going to buy power tools on the Internet, so don't bother me with it," you know. And zero in. There are a lot of people that are working on that, [E-shop], the company that's developing shopping software, has developed a technique that lets the server and the browser software talk to each other about the shopper's habits in the on-line space, allowing the server to customize the shopping experience even better each time.

So if I go into Tower Records and I never go into the Country and Western music space they can arrive at the conclusion I'm not going to be interested in the Country and Western promotional opportunity, but I might be interested in a jazz promo because I tend to spend my time in the jazz space. So customizing the shopping experience is a value to the customer if it's done well. That's one of the big opportunities, I agree. I'll pay you later.

Okay, so the forecast, the all important prediction. In 1994 and 1995 we size this market as — '94 I think we came out and we can identify about 240 million dollars. I'm going to

tell you what that is, that's retail sales, that's the value of the product, and we tried to total that up.

Now, it's a bit of a "chicken and egg" problem in doing these forecasts, which you may or may not know. You call up somebody like America Online and say "I'm not going to print your number individually, I'm going to sum it with everybody else's number, but I'd like you to tell me how much your merchants sold to your network." And they say "Yeah, right." And you do that with Prodigy and CompuServe and you really work it and you get some data in and you start putting that together, and then of course they come back and say, "You know, your numbers are all wrong." Of course, your industry projections are just no good anyway, so take it with a grain of salt.

But about 250 million in 1994, and in '95 we estimate about 350 million, but we see the years of '96 and '97 being a real growth opportunity. This is the famous hockey stick curve, of course. All projections have to have a hockey stick curve, I think, right? And that's because what we see happening in '96 and '97 is sorting out a lot of the security issues; it's really not impacting the consumer use, but it's really slowing down merchant and bank use of the Internet as a transaction place.

So a lot of security stuff is being settled and we're also fixing that demographic issue over the next couple of years, getting a broader penetration, and we're also seeing bandwidth to the users increase. Question over here?

M: [inaudible]

Emily Green: Yeah, I'll just give that a one sentence answer. The question was, what's the role of electronic cash in this space? I'm just going to give that a one line answer. I think consumers are very reluctant to experiment with anything that's really weird and they only want to move into things gradually, one step at a time, and the most familiar way to buy things right now is the credit card. I really think in the next couple of years that the mass market opportunity — for those of us that aren't going to take the time to understand electronic cash, the mass market opportunity is making credit card transactions safe. So I don't really think e-cash is going to play a big role in the consumer retail market. So that's that. All right, that's my last slide. I don't believe it.

Here is a summary slide — not the best summary slide I've ever done — but the on-line market is definitely growing and it has lots of growth ahead, it's definitely starting to balance, and the kinds of people you can reach will be a broader sample of the overall population. But again, it's far from ubiquitous and it's a long way from getting to be ubiquitous and it may never be ubiquitous. There is a lot of experimentation ahead, there is going to be lots and lots of attempts to create new content, create new business models. We think that most of them, probably just because of the way things look, most of them will fail, but some of them will work and there is plenty of opportunity to make money ahead. Okay.

[Panel]: I have a question. Earlier we saw some slides on revenue splits for content providers. Do you think that that's going to continue, that the content providers and the pipeline providers will be sharing more revenue?

Emily Green: No, I don't think — well, here is what I think. The question was: How does the split shape up ahead between revenue for the content providers and revenue for, say, on-line services, right? I think that over time there will be less free content as more people decide that they want to stop experimenting and they want to charge.

I think that the on-line services will trim the amount of content they have as they start looking more like a value-added Internet service provider, whereas at your pass at the Internet, on your way there you use some interesting stuff that can frame your experience of the Internet. So they'll trim their content, they'll choose it more carefully. And that may mean for the ones that are last they might pay more money, but for the vast majority the opportunity for revenue is diminished.

[Panel]: Thank you, Emily. We've got one more speaker, about 15 minutes, then we'll take questions for everybody. Our final speaker, and certainly one of our best, is John Hession. He is a partner in the Boston Law firm of Testa, Hurwitz and Thibault. Testa Hurwitz is a nationally recognized law firm known for representation of venture capital funds in emerging growth companies. John's practice includes the representation of venture capital funds and high-tech emerging growth companies, principally in the software and biotech areas.

Before going to law school, interestingly enough, John was a sales representative with [Educes Corporation], and given that and the fact that he is a lawyer you probably want to be around him [when] he dies, but...

John Hession: Given the fact that this is Halloween I'm not sure that this is necessarily a treat for you at the end of the day, and I promise this is not a trick; but I'll try to pull the fishhook out in about 15 minutes so I can get you out of here..

My comments are really a follow-up on to some the things that Oliver Curme of Battery Ventures talked about earlier, and it's more of the nuts and bolts of the financing for an Internet company. It's a little of how financing is structured. Oddly enough, it's very similar these days to what the biotech industry looked like in its infancy, I'd say in the late '70s, early '80s, with a couple of variations.

The change, if you will, from that model is that more and more you are seeing more than one partner, whereas biotech companies in the early 80s perhaps hitched their fortunes investing into one pharmaceutical company. You often see now — and it's a follow up on some of Peter's remarks earlier — that a lot of companies nowadays have several strategic partners in order to maintain their independence and maintain their options, as well as financing sources with deep pockets, all of them venture capitalists.

The thing you have to remember is that most of my comments here are going to be directed towards venture capital financing and what that looks like with a strategic partner involved. The thing you have to remember about venture capital financing...

I want to get a sample of my audience. How many are on the money side, on the financing side, if I can have a show of hands? Looking for investment opportunities? They keep their hands a little low because they don't want too many business cards at the end of the day. How many are on the entrepreneur side, or technical side, considering starting a business or looking to raise money from doctors, dentists and lawyers? Let's have a show of hands. They're actually not referred to as DDL; they're the three Fs — friends, families, and fools, not necessarily in that order.

Well, we start with the end, because that's probably the most interesting, that's the closing for Netscape. They just celebrated probably 300% compounded growth rate in a day and a half on their market cap, and the market is growing just as fast. The interesting comment on that is that there is enormous opportunity; the market is totally fragmented and there are very few bets on who is going to be the next Netscape, and as a consequence there is plenty of financing opportunities and plenty valuation opportunities. If you just look at it nowadays, it's kind of like the Winchester disk drive industry in 1983. Everybody has to have one of these companies in their portfolio.

Valuations are often in the private side and are reflective of valuations on the public side. They track each other in many respects. You have enormously robust, healthy, feverish valuations in the public marketplace, particularly for Internet or Internet-related companies, particularly those who have a leading product that have an enormous market power or the ability to leverage market share very quickly. You often see a reflection on that on the private company side.

I want to talk principally about deal terms and specifics today, what to look out for if you're an entrepreneur. Are you considering financing from a venture capital source? They are, as Oliver Curme reported to you earlier today, a strategic weapon. Some of my remarks here are to make you fire your weapon in the right direction, and not at you forehead.

Okay, deal terms and structure. Conventional deal terms for most of these financing is preferred stock. Most of the companies are C-corporations, and their earnings and their losses are captive in the companies. And you want to have the ability, if you finance that, that you keep those losses to offset against future income. But what does preferred stock do for you? It gives you enormous structural flexibility right now, [inaudible] at the limited liability. You may have heard a lot of stuff about that. It may be an opportunity to do something in the future, but people are not very familiar with it yet.

You typically have a preferred stock and it gives you a lot of flexibility; it gives the investor the opportunity to change the internal rate of return depending on how you structure the investment, and it's actually, believe it or not, despite all the bells and whistles about up-side protection or down-side protection and up-side guarantee for people, for the entrepreneur it allows you to price stock and set up stock options and restricted stock for your employees that are very cheaply priced relative to the venture investment.

What do they typically involve? Most venture capitalists do this for a living and they touch this stuff all day long, they know exactly what this is. These are the things that basically influence your investment return. It's about fifty pounds of paper, and all of this determines when they get out, how they get out and who gets out first.

You have to remember a few things here. Why is this important to them? It's important because the industry is characterized by investment funds that have limited shelf life. It's just a common phenomenon to the venture capital industry. Most venture capital funds are organized so that there are limited partnerships that die in ten years. They implode; they must distribute at the end of ten years whatever they have in their portfolio to their investors. They can't be hanging on to the restricted securities of a private company.

So they only have two options at the end of the game: the company either has to go public, and that's dependent on the market and market conditions, and an underwriter; or they have to sell the company to somebody, because ultimately they're in the game of liquidity. They have to harvest the investment in ten years. They have pressure themselves underneath them, in the investor base, to basically distribute, cash, or stock back.

So you have a number of things here in that deal structure that influence that liquidity pressure for a private investor.

Liquidation preferences — very quickly, you just get your money back. You put a million dollars in, at the end of the day you get a million dollars back before management sees the first nickel.

Cumulative dividends; we'll touch upon these briefly in more slides. There is a time charge on money. Why? Well, because I could have taken this and put it in treasury bills and made 7%. I'm not in here for 7%, however, at the end of the day. I expect to get: 1) my money back and 2) a time charge on that money, even though there is no expectation that dividend will ever be paid currently, because most of these companies do not have P&L statements or

balance sheets that can support payments of dividends, even when they go public. Why? The earnings are plowed back in to support future growth.

However, the dividend is basically a ticking time bomb. At the end of the day, if there is an acquisition it influences the rate of return, because if you have a 10% dividend, if you have a million dollar investment and it's a simple dividend, in five years if there is an acquisition, the investor gets the million dollars back plus the dividend, the \$500,000 dollars that's kind of earning but sitting out there, before management sees a nickel.

A Participating/Preferred. This is probably the most onerous of the terms, and it's actually — it looks harmless on paper; you get your dollars back plus you participate in any up-side in the company. If there is a sale of the company, it dies typically on a public offering.

Let's take a look at some of the things you will negotiate.

Management shares. Oliver made the reference that venture capitalists typically take somewhere between, I think he said 10% and 20%, 10% and 30%. That's only in the first round of investment, and there is usually several rounds of investment. The typical mix that you see before a company is taken public is often that the founder team has about maybe 30% employees that you need to attract with paper, with equity, because these people are working on a nuts and berries diet, so the reward is basically in the equity. You'll often see a reservation of setting aside a pool of capital of equity for members of the management team that you have to attract to the enterprise to grow the enterprise — technical people, sales people, marketing people each get a sliver of the stock options, because that's the promise, that's the reward at the end of the rainbow. And then the investors typically will hold the balance.

If I converted my stock or I take dollars out, I'm going to have a huge appetite for capital because it needs a very heavy marketing budget and a very heavy advertising budget, and that means a lot of dollars and successive rounds of financing.

Most entrepreneurs in this business underestimate the amount of dollars required to build a business of sustainable scale. That's why venture capitalists are there. If you want to grow a very quick business in a very short period of time, that's the kind of financing strategy you need to pursue, but it also consumes a lot of capital. A lot of capital.

Things you need to consider. Non-competition and non-solicitation agreements are common. They are not going to invest in a situation and watch key technical people, key strategic people, members of the management team decide to take a walk and set up shop across the street. They want to make sure the intellectual property is protected, so you'll see — except in California, where they are outlawed in the employment contract, not if you sell a business, but in the initial employment context they're outlawed — you will see as a condition to the closing that all key members of the team sign up one to two year non-competition agreements. This is the price of admission. It's very standard.

Employment agreements and severance agreements. If you are signing up for non-competition agreement, you want to think about — look, if you don't like the color of my suit, if in six months or twelve months from now there is a corporate divorce and we just decide to part ways, maybe you should have a severance arrangement. Industry standards are typically 6 to 12 months, depending on what strata you are, at what level you are. Six months would be at a director, your director of engineering level or VP of engineering level; the CEO might get 12 months, that's kind of customary, but again you're bargaining for that in connection with a non-competition.

One of the more painful things is vesting of stock. You know, you started this business, you mortgaged your home, it's been five people and a dog in somebody's house writing software source codes for the last two and half years, you paid a penny a share for your stock, you own it all and you're getting 3 million dollars from the venture capitalist and he says — or she says — “Guess what? That stock is going back into the pot, you didn't really earn it all, you

got it very cheap.” I don’t mean cheap; I don’t discredit the value of those services. However, if you leave in three years they need to replace that equity, they need to replace that person with equity.

If the CEO, who is founder of, let’s say, “The Enterprise,” has 10-15% of the company and decided after three years, “This is it, I’ve had it, this is too frustrating, you know it’s another 2 or 3 years of hard work, I want to go do something else,” everyone else in the enterprise, and particularly the financing source, needs to get that equity back to attract that next CEO, because there is the value in the end-game — the equity. So that’s one of the most painful things, and if it’s not on the table on day one it often becomes an impediment to the transaction at the end, if it’s brought up at the end. And that’s buying back — at a very good price — the entrepreneur’s stock, if the entrepreneur takes a walk.

There are often co-sales and rights to first refusal if management want to sell out or sell to somebody other than transferring to children or to a trust, that prior to everyone else getting liquidity they want to keep control inside the enterprise by buying back that stock and keeping it in the enterprise. Typically the company would have a right to first refusal first, followed by the investors, but typically no one else. What you often negotiate is the rest of the founder team gets a third right or shares in the second right to buy back stock if anybody else should leave. This is all premised by the idea that everyone’s got the up-side, and at that point there is a liquid trading market, that the investor, the venture capital investor has what he needs, the trading market to distribute securities to his limited partners, and the entrepreneurs sort of reach the goal that was promised in the first place.

Okay, let’s take a look at it briefly in more depth, just to consider what to look for. There is a lot of stuff I won’t bore you with. More wind is wasted over registration rights, which is the ability to force the company to go public... The key person is not seated at the table when that discussion is held, and that’s the underwriter. He is not there, he is not part of the discussion and there are twenty pages of legal “goo” that’s written about this stuff that frankly is just immaterial, so don’t waste a lot of time negotiating it. Give them what they want in registration rights; they are never exercised, and when they are it’s usually a liquid market trading anyhow. It’s a lot of words wasted over that.

There is often, as I said, preemptive rights, the ability play a part in additional financing of the company. If I’m a first round venture capital investor and I got 10% of the company and you have a strategic partner coming in, say NYNEX Information Resources, and they are buying 20% of the company, I want to make sure vis-a-vis that I’m protecting my position, that my stake is not diluted, even though I may be paying a higher price.

A couple of things. Liquidation preferences; I just want to focus on a few of these that are often opposite of the key terms on what happens. That’s basically where you get your dollars back, and the real economic affecting this is, what happens in the event of an acquisition? Does management and the investors come out side by side in the acquisition, or do the investors come first? Usually the investors come first, their dollars come before management. The issue is, do founders get a preference too? Do they get a return on their investment, too? They’re usually just holding common stock, penny-par value, that’s what they paid for it on that one. However, a lot of people have loaned money to the company, have mortgaged their homes to get things started, and one of the things you ought to consider as an entrepreneur is whether or not you share in a liquidation preference, because you put hard-earned dollars into the enterprise. That’s an important part of the discussion.

Participating/Preferred. This is probably the single most dramatic clause; it’s a sentence and a half in the fifty pounds of paper that you get and it alters the landscape dramatically, depending on what the liquidity event is. Participating/Preferred basically says I get my dollars. Let’s say I made an investment in a company for a million dollars and I bought half of the

company on day one, and the company was sold three to four years down the road for four million dollars. What the participating/preferred says is: if I own half of the company because I put a million dollars in, okay, I get the million dollars back first, and then based on what my conversion rate is on the preferred — and remember I said for a million dollars I bought half the company, no further financing — so I get my million dollars back in the 4 million dollar acquisition, that leaves three million dollars left to be divided up.

Half of that 3 million dollars, or a million and a half, goes to the venture capitalists. This is usually a very common structure in an early-stage financing, particularly for an Internet company where there is an enormous amount of risk. You just don't know what it's going to look like in a few years, and if there is anything that eats into management's hide at the end of the day, if there is an acquisition, it's that clause because that takes a lot of dollars off the table. Usually what people negotiate is called "IRR hurdle," that is if we do an acquisition at a fairly decent valuation and you get, let's say a 30% compounded annual rate of return, this thing automatically dies.

But this is a very tough clause. It's innocuous-looking, and most entrepreneurs don't know what it means until they start doing math, and I guess what I would do is when you see a clause like this, start doing math. There is a question of basically what the investor gets in the principal back and recovers in the up-side.

Cash-out elections. This hurts your flexibility in the future. What is a cash-out election? It basically says that if the company is sold, if there is an acquisition of the company, then I have the ability to decide about whether I get what I would receive if I converted my stock, or I take dollars out of the company. The unfortunate part of the problem, and this is where you need to almost work with your accountants on this in the early stages, is that most financing of the Internet companies, if you look at it, there is going to be a wave of consolidations and acquisitions in the next three, four or five years. And this frustrates what's called a "pooling transaction," the ability without any deleterious accounting effects to merge balance sheets and P&L of two companies as if they were existing on day one.

For example the Microsoft-Quicken proposed transaction. It was structured as a pooling transaction, and what is that? I swap stock for the target company's stock, and we merge balance sheets and P&L. And what does that mean? It means historically it looks like we were joined at the hip from day one, and all that happens is that Quicken's earnings or Intuit's earnings run right into Microsoft's P&L statement and their balance sheet, their earning statement, as if they existed from day one.

A cash-out election... When you consider that in most acquisitions structured for software companies, our preferred mode is a pooling transaction where people do a tax-free stock swap. And this kills it because if you have the ability to take cash out of the enterprise, it hurts a pooling. So the thing you have to remember is that if you do a financing that has this cash-out election clause — and this is the jargon you will see in term sheet — it really hurts you downstream if you're going to do a pooling transaction. It makes the company less valuable. You're negotiating at the table not only with the potential buyer of your company but with your investor right behind you, and you have a lot of flexibility. Question?

M: [inaudible]

John Hession: That's my point. Usually a stock swap is cash, is tax-free, and you only recognize the tax when you sell the underlying shares. For example, in the Microsoft situation Microsoft gives shares to Intuit for — you know, the Quicken product line — in that when the Quicken holders sell that stock, and you can time that whenever feel like it, when you sell that stock then you get whacked with a tax. What this does is make the transaction convertible from a

tax-free transaction. And from an accounting prospective, if you're paying a premium over book value, all of that difference between the value you're paying for the company and what the book value of the company is is a charge to earning for the buyer. Buyers just don't like that; they will pay less for companies on valuation if they have to take a charge for earning. It's neutral if it's a tax transaction. It really influences what happens to your future in many respects.

Cumulative dividends. We talked about it, and there is no exception of payments, it's just — remember what we've got here. I want my money back, 1 million dollars and 10% interest in essence, but it's not currently paid. It's usually forfeited if there is a public offer. However, in an acquisition that's where it's recovered, and that can influence rate of return. If you did an acquisition five years out, and you had a 10% dividend on a million investment, that million dollars of liquidation preference is now worth a million and a half dollars. It grows slowly over time but it has kind of a compounding effect. Question?

M: [inaudible]

John Hession: Absolutely, annual...

M: [inaudible]

John Hession: Yeah, there are a lot of laws in most states that say that Visa card companies can't charge 18%. But that's what this is. But you will see that there is not expectation of payment; only if there is an acquisition of the company. And you don't get out at a predetermined rate of return.

So yes, you will see — and where is it appropriate to see it is in a very early stage of financing that the management team has not fully developed the business plan or marketing plan, and may not be quite launched yet, and the product is just coming out of prototype. There's a lot of risk, and therefore that rate of return of the 30% built-in rate of return is sort a natural for that situation.

[Tape change]

John Hession: ...is painful, that's where it's very painful. And the earlier the stage of financing, the more you will see that. Strategic partners technically don't ask for these kinds of investment vehicles. However, they're getting smarter, and they are basically saying, "Well you know if you have the first round of financing with Battery Ventures, and we're going to make X," you know NYNEX comes in and says, "We're going to do an arrangement where we provide you service, the ability to be one our long distance network or use some of our services as well as make a strategic investment, because it makes the company look good," you've got a partner that's validated the strategy.

What often will happen, and this is in very difficult negotiations, is that investor will say: "Well, we'll just take the terms as your first round investor." If you're a first round investor your venture capital investor has tough terms, and it's going to get doubly tough, because now you have a strategic partner who is looking for the same financial rate of return that the pure capital investor is looking for, and he is getting more in the transaction; he is not just taking money or giving money, he's providing services, and he is maybe getting content or services or technology from you.

You know, you raise a good question, and it creates a lot of problems because as I said, a lot of the models nowadays have both the financing vehicle, the pure financing vehicle, the venture capitalist with a great Rolodex and good contacts for strategic partners, and a strategic

partner who has several directors. It's got a financial directive, it's got a technology directive and it's got a distribution directive. And sometimes it's hard to marry the financing model with those directives.

Okay, anti-dilution protection. This is if you sold a valuation at this price, and you go out and raise the money below for foreseeable future. For example, we value the company — before the venture guys come in — at 5 million dollars, and it translates to \$2 a share; this basically says I have the ability to re-price my investment if you do a financing below that \$2 per share valuation. If things get tough, you're behind in the marketing plan, you're behind on the technology and development curve and you're not going to make payroll in two weeks and you don't have a plan of financing and you need about a half million dollars of bridge investment, that's when this terminology comes home to haunt you. Because if you've got to raise money at a cheap price, the investor gets a second look and has the ability to re-value the investment at tomorrow's lower valuation. If your valuation goes up, it's ignored.

You know, everyone has made the right bet, and the value is going up. If the valuation goes down that investor needs to participate in the company, to support the company. Let's say now I'm coming back in and I'm investing at 50¢ a share valuation rather than \$2 a share valuation; that earlier valuation gets re-priced. And the effect of that is that the earlier round investment gets more shares in the company as a consequence.

What can you do to ameliorate that effect? Well, you can have things like if after a certain period of time it expires, after you get an investment from a strategic partner and it expires, you can do any number of things, and I always say look at the economics of the situation, and look at the where your cost-to-capital is going to carry you.

If you have a two year cost-to-capital that these finances are going to support you, then maybe it's natural to protect the investor for the first two years where there is an extra risk that you may have to go out and raise more money at a cheaper; but thereafter everybody is in the same boat at that point in the game when we all should share the risk on an equal basis.

Here is a key thing that you have to have and that you need to negotiate up-front: a "basket" for management and employees. Typically you'll see that both management and investors recognize that while technology may drive the situation, it's people more than anything else that make the enterprise very successful. You need to attract people to the enterprise, and to do that you need to give them some equity, and you should regard your equity quite jealously. You should not give it away like candy. There is a lot of companies I see do it; they like to say that everybody gets an option in the company, from secretary all the way up.

Well, I have a feeling that secretaries, when they get a five to ten page option agreement, really don't appreciate or understand or care what this is, and the numbers are meaningless to them. I think it's more important that you have an option program that rewards people for contribution to the enterprise, because this is where people have the possibility for becoming millionaires three, four or five years down the road.

You should also realize that attrition is high in this industry, and therefore you should tie your option-vesting schedules to ones that make sense. You should have any portion of the option become exercisable or vested, so the employee has a right to touch it and exercise it in the first 6 to 12 months. Why?

Attrition rates in this industry are the highest in that period of time. Why give somebody equity who can walk away with it when there is a possibility you never got what you bargained for, which is maybe a two, three or four year commitment? And you should understand the commitment level required. Are you two years away from a public offering or four years away from a public offering? If you're four years away from a public offering or an acquisition then you should have a vesting schedule that may be dependent on those four years

that the stock — that's over time at 25% annually — so the linear performance of the employees is tied the economic model.

We think we are going to get there on the curve, on Emily's hockey stick, at the top of the curve in four years. Have your option program tie to that performance schedule. Why? You don't want to run the risk that you make a lot of people millionaires too early, and then they — you know, the beach in Tahiti looks a lot more pleasurable than the streets of Cambridge.

You know, I had a classic situation for a company that we just took public about three months ago, and they put in an option program about a year and half before they went public. All the top management got to sell their shares and their options in the public offering, and the VP of Sales said "Oh, I've been doing this for eight years, and eight years is long enough, I feel like doing something else."

And six months after the lock-up expired, he sold his shares and gave his resignation. You know, he was tired, but the problem is that you didn't get the reward out of that you were looking for. So tie your vesting schedules to your horizon for what you want this company to be. And not longer than four years, because longer than four years is an infinity.

Okay, there are a couple of things about the investor wanting his money back, and usually if there is a [port] right, there is the ability. And why is that? Investors have liquidity concerns and if they have to get out of their investment in five or six years this is a way to get out of their investment — they force the company to buy it back. I sort of say "Good luck" to the company that doesn't have any money and is bound to something that they can't pay for. You're squeezing blood from a stone at that point. These sorts of clauses, I think, are worthless and there are a lot of fights that go on over it; but at the end of the day, to me market success is the best indicator of the economic performance. If the company is doing well, this thing disappears.

Board composition. This is important. There is a lot of political and emotional and personal issues that go into this kind of mix. How is it determined who is going to be on the board? And my suggestion is that you really don't want a board of directors of more than five people. Seven or eight people, it's like Caligula — it's a Roman orgy, and you never get anything done, there is a lot of paralysis in decision-making, there is a lot of people expressing opinions. It's better to take a position, understand it, make sure it's fully supported and head in that direction rather than have five different voices suggesting where the company should go.

You all should have what I would call the "martini" rule about venture capital investors on the board. I think management, the proper board mix may be one, possibly two people from management, typically the CEO, maybe the VP of Sales, VP of Marketing. And as the company grows, that drops off, because what's a board supposed to do? The board's main role is strategy and direction. They should be giving you guidance as to where the company should be going, giving you feedback not on day-to-day tactics, [but] on is this the right choice, is this the right direction, is this the right partner to be with, is this the right structure for that partner? So you should look for people typically who have industry experience, either operational experience or sales and marketing experience. I said to you those three things are key ingredients, someone with outside industry experience in the sales and marketing side.

Because this is usually where there is a critical failure, a critical lack of talent in the early stages. And what you should also have is maybe one or two investors. But what I usually advise against is the martini rule — having three venture capitalists on the board is kind of like having three martinis. The first one you're feeling relaxed and comfortable, the second one on the board you're feeling very, kind of heavy a little bit, but the third one is a guaranteed headache in the morning. So limit those.

Voting Agreements. Voting agreements are basically how you structure the board so you are guaranteed an input. Okay, couple of things; this is the last slide, I think, so the fishhook is out and it's kind of coming on my neck from Tim.

A couple of things to think about, as I said. A lot of the financing models nowadays have a professional investor in it, a venture capitalist as well as one or more strategic partners. And that's key. The biotech model usually had one and that was part of the problem; you hitched your faith to a large elephant that you didn't know what direction they going in, and the problem was you often got stomped in the living room.

Venture capital and strategic partners. By that I mean people who work and leverage your resources: on-line services, large software companies with multi-faceted distribution channels, whatever. By venture capital I mean someone who is providing directly. For venture capital there is a very large impact on management economy because they are on your board and they are reviewing your situation on a month-to-month basis. For a strategic partnership, depending on whether or not you got an exclusive arrangement or several non-exclusives — and the later is a low impact on management autonomy, except for the early stages when you have to build the program. There is a lot of time that kind of goes into it, six months to nine months of building a strategic alliance, and that's getting and selling people on the market strategy and the distribution strategy. The balance of that, really, is making the thing successful, and that's usually people just below who are heavily involved.

In terms of management involvement, venture capital is a very high involvement on an ongoing basis, because they have to report to their limited [partners], they have a number of portfolio companies they have to manage, and the goal is liquidity at some point in the game so they have to make sure this company is on the right track, it's hitting all the right milestones in terms of the product performance, in terms of signing up other partners, in terms of revenue ramp and distribution ramp.

For strategic partnerships and management involvement in the implementation, it's often a very high time commitment. Progress reports, meetings, that sort of thing, a lot of tactical issues that are dealt with.

The ongoing involvement really depends on whether or not it's an exclusive partner or several non-exclusive arrangements. You know, as Peter was saying here earlier, I really would recommend that you really have to consider non-exclusive arrangements if you want to be successful, and make sure you maintain you independence.

We'll go to the next one, and there it is. We started at the end of the process, the Netscape public offering. And you know, hopefully that's exactly what you have to do at the end of the game here. You've got a successful venture capital investor, several successful strategic partners, and now it's time to consider a public offering. That maybe reversed; that may be looking for venture capital investment, and there is kind of a "pig on a poke" maybe sometimes, but it's a little bit about what this process is.

It takes — you have to remember this is a long process and there is a lot of luck in it. A lot of entry firms like Battery Ventures, for example, whom we represent... You know, a partner in a firm like that might get, on average, 400 business plans a year. Oliver Curme might do three to four new investments a year, because he's also got to manage existing investments. So that's [inaudible], to get from 400 to four is enormous.

And a lot of times it's luck, it's having what I believe is a great executive summary. It's what Emily and I were talking about in the break, the 30-second elevator ride where you can tell your story and you can understand the market opportunity in basically a flight through ten floors on an elevator.

So, with that, good luck going on up on your elevator. I wish you well. Make plenty of money because the rising tide lifts all boats.

Timothy Duncan: We've covered a lot of real estate today. It was a long afternoon, we got some great speakers, and I hope everybody got some information from the program. I'm in the book and there is a speakers guide. If anybody would like to make any comments, my phone number, address, and e-mail address are all in there and we are probably going to do something like that in the Spring, so if you have any comments or suggestions, please feel free to give them to me.

Thanks a lot.

ACCESS PROVIDERS

SO YOU WANT TO BE AN ACCESS PROVIDER? HERE'S HOW!



SPEAKER

Bob Berger

Chief Technical Officer, InterNex*Tiara

Bob Berger: I'm Bob Berger from InterNex. To become an Internet access provider looks easy from the outside. When I first started, I didn't really have an intention to be an Internet access provider; this was in early 1993, and my goal was to really start offering services to help people access and utilize the Web, which was really new at that point. At that time I had done some work previously with ISDN, and I expected all the Internet service providers to be rushing out with ISDN access to the Internet, because at that point the only choice you had was analog dial-up or T-1s. Analog dial-up, I believe, is too slow for actually utilizing the Web, with graphics and audio and things like that; and T-1 is too expensive for most businesses to really use if they just want to surf the Web and access it. When I called around to all the existing Internet service providers, I found no one even had any plans to do ISDN, so I thought, "it can't be that hard..." So I found out it's really hard.

When you're going to start up being an Internet access provider the first thing you have to decide is what kind of scale of operation you want to aim for. It can be anything from a small, single POP — really just a step up from a hobby — where you want to just service your town or your city; you're in a smaller area, so a single POP potentially could service a town or a small city.

The next step up would be a regional operation, where you're going to cover an entire region like the Bay Area or the west of the Boston metropolitan area, or something like that.

And then finally there's the big leagues, there's the multi-regional, where you might cover several states or national. So you really should decide that in the beginning where you are going to target.

The next — just as a side thing, a POP is a "point of presence;" it's sort of the atomic element of any kind of Internet architecture. What's important about POPs is that's what creates your local point of presence so that people could have local dial-up access; if you don't have local dial-up, then that means that besides whatever fees you're charging, the customer will also have to pay any long-distance charges — and most customers are not willing to pay a long-distance charge if they can get competitive service without it. In some areas people are using Centrex as a technique to give flat-rate calling to their customers. I believe that Centrex coverage is an artificial loophole in the phone tariffs, and will go away as a technique for giving people flat-rate access; we'll talk a little more about that later.

So if you are going to go after the idea of doing a single POP for a small location, that's the least costly approach, and it doesn't have that many challenges. You can kind of do it with just a little bit of hardware; it costs about a little more than a car to set up. But I believe that you won't stay alive very long; if it's just a hobby and you really don't intend to make money you'll be fine, but it has no long-term viability.

[Being a] regional provider takes a lot more work. We are located in the Bay Area, which is one of the most competitive Internet access markets, and it took us actually about thirteen POPs to cover the Bay Area; if we were to use Centrex we would have had to put in many more. A regular POP covers about twelve miles, and that's really dependent on the tariffs in your area; but with most U.S. RBOCs it's about a twelve-mile radius in metropolitan areas. If you did Centrex, Centrex has about a three-mile coverage; it's really what can connect, usually to the central office, that the Centrex block is on.

Doing a regional business is technically and financially much more challenging. You're now talking about easily hundreds of thousands, if not millions, of dollars. Also the technology to deploy it — it might look simple, "oh, you just need a bunch of servers and a bunch of dial-up ports," — but to do it right, to do it with quality, as we'll go into, takes a lot more. And you're now into a big business; you have to have all the things a big business has. You have to have strong sales, strong marketing, financial operations, inventory management, and capital management. But I think that there is still a niche, particularly in a lot of, not the top cities, but in a lot of the secondary cities' it's going to be a while before the big people have coverage into those areas, so I think this is a potentially viable marketplace still. But you have to expect that if you stay a regional, eventually there's going to be a consolidation and you'll either be bought out or put out of business, one or the other.

And then finally there is the multi-regional providers. That becomes even more difficult technically, because now you have to worry about interLATA communications where you have to utilize carriers that can cross boundaries; you can no longer use your RBOC's frame relay clouds. You have to find providers that can backbone all your traffic across regions, across state boundaries, and across LATA boundaries. Your routing and network management become much more difficult, and the capital at this level starts to become — we're talking the UUNets and PSIs and RBOCs — which are capitalized, as we'll talk about later, at 40 to 100 million, or billions. And the sales and marketing efforts become even more tough.

So once you decide what kind of service area or scale of business you want to do, then you have to decide what type of Internet service you're going to offer. At the low end there's the analog dial-up using shell accounts. There is dial-up PPP direct connections, high-speed ISDN, and then dedicated services.

The shell accounts are what a lot of the older companies started with; NETCOM really started as a shell account company. It's the easiest way to get started [because] it doesn't require a lot of routing experience. It is really a UNIX kind of operation, but it requires a lot of UNIX experience; you're going to basically be a big UNIX system administrator.

The other downside of it is that it doesn't scale well. Once you start getting up to the thousands of customers, or tens of thousands, you're hitting some boundaries of UNIX time-sharing and it doesn't allow you to — you can't just throw machines in to get bigger. You have to really start re-architecting, and you just hit some brick walls. I believe that's why with the performance of a lot of these systems, like NETCOM, it's not their networking that is congested, it's their servers. And it doesn't support client/server applications very well; you really can't run *Netscape* from a shell.

The next interesting area is still using analog dial-up, but using PPP or SLIP as the connection technology so that your customers will then connect to you as a direct IP connection. That means that their computer, when they're connected, is connected directly to the Internet and they can fully utilize all the client/server facilities like *Netscape*, FTP, things like that. It is still modem-based, but your speeds are in the low end; it's 14.4 to 28.8 modem speeds. And also for the customer, for them to connect to your network takes twenty seconds to a minute and a half every time they want to connect — and that doesn't allow for creating a virtual link.

What we have specialized in is ISDN access. I believe that ISDN has a pretty good future at this point, at least for the next couple years. It stands for "integrated services digital network," but people always made up silly acronyms for it. It used to be "I still don't know," but now the RBOCs are saying "I see dollars now," and Bob Metcalfe coined his "info superhighway delivered now."

The biggest thing about ISDN is obviously the fact that it's about ten times faster than a 14.4 modem; that alone is enough to make it interesting. Once you cross over the 56K speed

boundary you can do things that you normally wouldn't do. Using the Web actually becomes a productive tool; you can really use it as an — you just basically have it on your desk all the time, and you click on things when you want to find it, and you're not sitting there waiting for the graphic to just come down for a minute. It really changes the whole way you can utilize the Web. And because of that speed, it also allows you to use it for LAN connections, so it's suitable for connecting small LANs for businesses to the Internet.

In the last two years there's a lot more hardware now available to connect ISDN to Internet services. On the show floor there's Ascend, which is making some of the premier equipment. And what used to be CombiNet, now part of Cisco, also makes some excellent products. And there are now products in the under \$400 price point to connect PCs to ISDN; so that's a kind of an enabling technology.

We have a couple more things... There are some subtle parts of ISDN; the fact is a call can be connected and completely set up, so that from the time you start the call to when you're routing packets can be in the order of a second. That again creates a new paradigm of how you use dial-up services; the fact that you can have a call set up in a second means that you can have your line go up and down on the order of every couple minutes. So let's say you click on a Web page; you're now reading that page and it might take you a while to browse through it. The line could go down while you're reading, and as soon as you click on another link the router senses that you're trying to route some packets and will bring the line up in a time that is imperceptible to you.

For an Internet service provider that's great, because that means that your dial-up ports are going to be able to be utilized much greater and by many more customers. And for the customer it's an advantage because even though it feels like they're on-line five hours a day, their actual connect time would only be a couple hours. So that's really a key feature that people don't really know much about.

Now, as I said, the graphics are much more accessible [using ISDN]. Using the Web is much more accessible; telecommuting becomes much more of a reality. As an Internet service provider telecommuting is one of your secondary businesses; if you are putting out these POPs you can sell the access of those POPs to corporations that want to aggregate their telecommuting traffic through your backbone. With ISDN you can do a lot more kinds of file-sharing and kinds of telecommuting type of work, so it really makes the Internet a much more serious business solution. With modems you can toy with the Internet, but to really use it in business you need the speed.

Finally there's high-speed dedicated services. These require much more technical sophistication but are also much more lucrative, and they also help you create your backbone. Today the key ones are frame relay, which is very popular now and very easily accessible; most RBOCs supply it in very low-cost forms. Point-to-point has been the traditional way that people have done high-speed connections; the downside of point-to-point is that you have to pay for the T-I between the customer and you on a per-mile basis, and even if it's just sitting there you're paying for it, whereas with frame relay SMDS they are distance-insensitive. The customer has to pay to connect to the cloud, and you just have to pay to connect to the cloud; there is no distance charge. And because of the statistical multiplexing of the cell and frame-based technologies, the costs are much lower.

So let's say you have now decided that you're going to do one of these services; you have to decide how you're going to allocate IP addresses. Most people getting started think, "Oh, well, I just get a Class B." Basically they're not giving out Class B's anymore; you have to now get chunks of Class C. They're called CIDR blocks, and this becomes a major headache both in terms of — if you're a small provider — trying to get that, [since] the Internet will no longer give that out, and then managing it. We'll talk a little more about that.

And that sort of leads into the [matter of the] feed. Once you get started, one of your biggest problems will be finding a way that you can get your fat pipe to the Internet backbone. You have to be connected to a cell. One of the things that I found a little confusing when I got started is a kind of the search for the fountainhead of the Internet. The Internet has no central authority; it has no central point that it emits from — it's a network of networks. So you still have to find some way to connect, and you need to find some way to get blocks of IP addresses that you can utilize to sell to your customers that are on your network. So I'm just going to review now kind of what I went through in trying to find that.

First you think, "well, I should just go to the InterNIC; they're supposed to be the closest thing to running the Internet." And what I found is that [InterNIC] was funded by the National Science Foundation, but it's there mainly to manage the address base and the domain names base. What's happened in the last year is the InterNIC will now only give blocks of addresses to major Internet service providers; they expect others to go to an Internet service provider to get their block of addresses. Then I thought, "well, there's the Commercial Internet Exchange." They were founded to purposely support "peering" of commercial Internet providers; part of their fundamental agreement is that they will route packets between all the members. But it turns out that a CIX membership does not give you transit — meaning that if you have a CIX membership and you buy the routing option you can route to any CIX member, but they will not route it past their customer base. So that's what "peering" is called.

What you need is a transit link, meaning someone that will take your packets and connect it to anyone that's on the Internet, even if they are not a CIX member. So the CIX can be a good thing to join because it does give you a certain kind of connectivity, but it's not the only kind you need. Then you might have heard of the NAPs, the "network access points," which is the remainder of what the National Science Foundation is funding; it's a place where national Internet service providers can peer. But it is, again, not a place where you can go and just buy a connection and be guaranteed that your packets will go anywhere.

At this point there are four NAPs. Again, it could be an interesting place to connect if you can buy transit from someone that's there; but today at most of the NAPs you need to have an ATM connection, so you have to be able to step up to being able to both technically support ATM and financially support it.

Then there is what I call kind of "the cartel," because that's what I discovered there seemed to be. There is a group of the large Internet service providers; they all agree to peer with each other, and there are actually public peering points where you can buy from MFS a connection to what's called Mae East, or Mae West, and there is now, I believe, a Mae Chicago. This is a place where Internet service providers can buy from MFS a Layer 2 interconnection that is the equivalent of Ethernet or FDDI connection; and all the packets — a friend of mine called it a dog pile — all the packets kind of go in there, and you can theoretically peer. But, again, you have to have a peering relationship with someone so that they will actually allow the packets to enter their routers and enter their networks. So again this is a place, if you have a connection, [where] you might be able to arrange a peering situation, or you might be able to buy transit from someone there and use that as a place to connect to them.

A lot of small Internet service providers go to what I call the "gray market," and that is other local service providers that happen to have a feed and have the ability to resell it. But what you have to watch out for there is that many of these providers might only have a T-I and are already radically overselling it; so you might be one of a hundred T-I's all being fed from the single T-I that they have. Plus, again, there comes the issue of who controls the IP addresses you get. If you are now getting an IP address from their provider, you are now three steps removed from controlling your IP addresses.

When I started the business, what I did was I ended up buying a connection from Sprint. At this point I believe Sprint and UUNet are the only ones that will sell you explicit T-1's that you can resell — though I have heard that Sprint might be trying to get out of that, [because] the problem is the cost. And again, they control your IP addresses. Some of the other national ones, at least when I last checked, were not selling to resellers. And then finally a new company arose about a little less than a year ago, and they so far have been kind of the champion of Internet service providers, where their business model is to sell to other providers, and they are designed to be a backbone-only company. You can probably access them on the Net at [www.\[AGIS\].net](http://www.[AGIS].net).

So let's assume you have arranged to get a connection; the next step is putting things together and figuring out what kind of equipment you need.

By the way, at anytime you can hold up your hand if anything's not clear.

So you have looked at what's available in terms of feeds; now you have to determine, based on the kind of services that you are going to offer and the kind of area, what kind of speed of feed you're going to get. And the minimum is really, I believe, a T-1, and even that's becoming a little bit low now. Yes?

M: Does [AGIS] provide your connectivity to the CIX and the NAP?

Bob Berger: They provide physical connectivity and a route through the CIX; you have to be a CIX member, but they have private peering. The question was, does [AGIS] connect you to the CIX and the NAP? [AGIS] has connections to all those points, and what you buy from them is transit. To actually peer with the CIX you would have to be a CIX member, but it is kind of a moot point because they have direct peering relationships with almost all the CIX members directly; so you basically get to everybody through an [AGIS] connection.

W: [inaudible]

Bob Berger: The question was if you are going it alone, should you still be both a CIX member and a NAP member? The CIX membership only makes sense if you are in California LATA 1, because otherwise you have to buy a long-distance SMDS connection to connect to them. In terms of being a NAP member, you don't really need to do that; that's only if you were going to be very large and be a national provider at this point.

M: One last question. If you are a small service provider, a very small service provider with shell accounts or something like that, would you recommend [AGIS] as a good way of going?

Bob Berger: The question is, if you are just doing a shell account style, would I recommend [AGIS]? At that level you have a little more choice. The Sprint connection, or [AGIS], or even the UUNet could be a good option because you don't need that much bandwidth; you're not reselling IP addresses. It's really when you start reselling IP addresses that it becomes a little more complicated. But if you're just doing shell accounts, that is really one machine, or just your machine that is connected, and the people like UUNet don't really consider that reselling.

Something that's probably even more important than having just a T-1 is — again, most of my talk from now on will be mostly focusing on PPP type situations where you're having connectivity — and in those cases it is really important to have multiple feeds, because what we found with Sprint was that Sprint for a while was our only provider, and every time they had a problem, we had a problem, meaning there could be days of down-time for all our customers.

M: I have been asked a question by a number of people. What if you're a large company with your own Internet number and you're not happy with the service providers? Can [AGIS] provide the necessary [inaudible]

Bob Berger: The question was, if you are just a direct business feed, would [AGIS] sell that? I believe so. So, getting back to having dual-homed connections, that becomes really critical for a quality service — meaning that you would have at least one T-1 from one provider and another T-1 from another provider. What that allows you to do, assuming that they are not really coming from the same source, is that when one goes down, you have a hope that your whole service won't go down, and that you will be able to reroute. Just like in case of an atomic war, you reroute the packets to your other routes.

The thing about doing multi-homed is that now you're stepping up to a much more sophisticated routing situation, and you're doing what's called "BGP routing," and we will talk about that a little bit more later. Then if you're going to do a regional kind of operation or you're going to be doing a lot of Web servers, you really have to jump up to 10-megabit feeds or greater.

In terms of location, if you are going to be a small provider, obviously one location is going to be okay. Sometimes what's probably the most important thing is where you put your backbone operation, because what you really want to do is be on fiber. You want to ideally find a place that's what we call a "fiber nexus," where a lot of different telco facilities bring their fiber to a termination point, because that gives you the ability to scale your business. It's also possible to get cheaper bandwidth that way. And if you do that — or actually wherever you put your operations — get a long-term lease. You're going to pay a lot to have lots of T-1s and fiber and equipment and custom racks and things like that put in, so you want to make sure you can stay there for a while.

The network operations center, the place where you kind of run your network, ideally should be in the same place as your backbone operations, but it doesn't really have to be. Same thing with the business operations; again, depending on your scale, you might find that you put your machines in one place because it's great fiber, but it's a terrible place for people so you might put your business operations elsewhere. That, of course, complicates communications within your company; but sometimes it works that way.

I had some difficulty trying to decide what to put in this slide, so I kind of aimed it at a middle to high range of the kind of service we provide... Again, if you are just doing a single POP or a very small operation, a lot of this could probably be compressed into one Cisco 4000; but if you are doing something that is multi-POPs, you really have to aim for this kind of architecture. You might be able to start out smaller, but when you put your architecture together think at least this scale. If you are going to have multi-homed greater than T-1 backbone connections, you need a 7000-class Cisco router because you are going to be doing BGP routing, and today on the Internet the biggest limitation is the routing tables. That's the place that is being squeezed right now; the routers can barely hold the routing tables for the entire Internet. And if you are connected to a backbone, you must be peered with that kind of scope of routing tables, so you have to think of a 7000-class router. It also becomes important if you are going to supply dedicated services.

So you can use the 7000 as the place where your T-1s for your frame relay for your customers will come in. Then, if you are going to do multiple POPs, you really have to think about your internal routing protocol. The external routing protocol is BGP, which stands for "border gateway protocol." That is probably the most esoteric of the routing protocols, and is the one where you really have to make sure you have experts in-house, or on call to help you set up and maintain it. Then internally we use OSPF, which allows us to create a pretty

sophisticated hierarchical routing architecture for all our POPs, and we use dual Cisco 4000s so that we have redundant routes when it goes down. And then all our POPs are connected to these 4000s through frame relay.

Again, this is the kind of stuff that surprises you when you get into it. There's probably not that many people in the world that really can put together these kind of networks. The kind of problems that you have are things you just can't expect, and if you're connected to the backbone it means that you potentially can screw up the backbone. You hear that the TCP/IP is supposed to be all robust, and could withstand nuclear wars and things; but it is possible for you to put a configuration into that Cisco 7000 and it will at least screw up your neighbors — and your neighbors could be MCI or Sprint or whatever. So you have to be pretty knowledgeable at that level. Then internally, if you're going to have a large internal network, again it's sophisticated routing that's kind of on the leading edge.

M: What are your recommendations on servers and what the range [inaudible]

Bob Berger: I will get into that in a minute. We show an FDDI ring as connecting all our routers and servers; that could just as easily be a high-speed Ethernet, or just regular Ethernet. Again, it depends on your scale. You could probably start off with a switched Ethernet, but if you're doing multiple T-1s, if you're doing multiple 10-megabit feeds to the backbone — which is what you need to be at if you're at the regional level — you need to have greater than Ethernet speeds in your internal backbone. And for today, we use FDDI. Maybe in another — even starting today — in another three to six months, one of the high-speed Ethernets could be an alternative, or even ATM. And of course you need to have UPSs, "uninterruptible power supplies," everywhere, or at least a central one.

So to answer your question about servers, routing is just one part of the service you have to offer; there are then a bunch of services that are considered integral to an Internet access provider. So the equipment you need, or the kind of equipment you need, are basically UNIX servers, and you want them to be reliable and robust because they are basically now mission-critical elements. You need at least two servers, and really the minimum is closer to four, because you should basically have at least a server per service. We'll talk about the services later.

You also want to be using RAID arrays for your disks for DNS, mail, and news and things like that. And of course you need backup and, again, the UPS. We'll go a little more into some of the things you do with these servers. We use Sun Sparcs running *Solaris*; there are providers using Pentiums running BSDI. I recommend not using cheapo PCs.

M: How about Macintoshes?

Bob Berger: Well, Macintoshes, they would have — the question was, how about Macintoshes? Macintoshes would have ease of use and they have a lot of facilities, but I don't think that they are adequate for this kind of operation. Again, if you are doing a smaller-scale operation it could be okay; but I think the OS's on Macs — there isn't an OS on Macs, so....

M: How many clients are you talking about on your system? You say "our" system. Approximately how many people would this be?

Bob Berger: The question was, how many people or how many lines would this kind of service support? At the scale of two to four servers, that could probably support in the order of a

thousand, maybe a little bit more. Depends how heavy of users they are, if they're modem users. About three hundred to five hundred ISDN users.

M: Simultaneously on-line?

Bob Berger: No, we're talking about an installed base, a customer base. I mean, it depends upon what kind of quality of service; the service we offer, we tend to be more a higher-end, premium service. It depends what your customers are doing, what kind of customers they are. We are in Silicon Valley; they tend to be really demanding and expect tremendous technical support.

M: [inaudible]

Bob Berger: I was about to talk about that. Again, this is a little review of the kind of software that you will be running. I think Windows NT is not quite there yet, or at least I wouldn't do it; there are some people — as a matter of fact [some] RBOCs — doing it. Microsoft is doing it. I think Microsoft is having problems because they're doing it; it's a risk and it's not worth it. I mean, I don't think that all the services, all the security issues, all the tools are there yet. Maybe in a year; I expect, unfortunately, that Windows NT will be the platform that everything is on in the future, but today I won't use it.

We talked about kind of the backbone operations, the kinds of stuff you need just to offer the services — yes?

M: Could you back up to that last slide for another moment, please?

Bob Berger: Maybe. Actually, not right now. These will be published as part of the CD-ROM, and I will try to get it on my Web page, too.

So we talked about the backbone operations, kind of like the back-end stuff. The next area, the network operation center, is basically kind of the user interface to your network operations. It is where all your people, your engineers and operators, monitor and control the network, so you will need again probably another UNIX server. We use Sparcs running *Sun Solstice*, *Sun Set Manager*; we use that to do all the network monitoring so hopefully we know about problems before our customers do. It's pretty important to have some kind of network monitoring so that you can tell if your network is having problems. In the back?

M: Please repeat the questions so we can hear them back here.

Bob Berger: Sorry. The last question was, can I repeat the slide, and I said "no."

So besides network monitoring you will also need to have some mechanism, some tools, to do customer turn-ups. Adding a customer to whatever system you're using, entering it into your billing system, that's an area; and then you need some kind of trouble ticket system. We are using the *Remedy ARS* system; it's a multi-platform system that allows you to track trouble tickets and dispatch them.

So from the backbone we now go to the "point of presence." Again, the purpose of the point of presence is to give your customers local calling so a local phone call will connect your customers' computers to your network. You have to allocate — again, we're talking about PPP or direct connections, we are not talking about shell — you need to allocate and manage IP addresses down to the POP, and then you need to have some mechanism to authenticate your users. PPP supplies the client level. It allows people to transparently log in and authenticate with a user ID and password; but then you need something on your POP that your router uses to

actually manage the database of customers. When you start getting up to hundreds and thousands of customers, that becomes an issue. And there's questions of "does it happen locally at the POP? Does it happen back at your central site?" We happen to use a distributed *Radius* database to do that. Yes?

M: What is DNS?

Bob Berger: The question is, what does DNS stand for? DNS is "domain name service." We will go a little bit more into that.

Another exciting feature of POPs is that they generate huge volumes of billing information. You need to be able to capture that and process that as well. Every time your customer calls in, it is a record; every time they hang up, it's a record.

We believe that it is important to distribute the services we talked about — mail, news, DNS, things like that — down to the POP, so that as you build more capacity you're building more capacity not just in the number of ports that can dial in, but [also] in the capacity to service the customer with mail and news and other features.

For an analog POP, traditionally you've got a bank of modems. If you are going to do any kind of sophisticated routing you need to have a quality router in there. That router is used for your backhaul, so you're going to be aggregating all your traffic from all your modems into a local Ethernet, and then you need to take that traffic and bring it back to your backbone operation. That's what the Cisco router is for.

You need a CSU/DSU to go with it; that's just to terminate the T-1. And you need some kind of terminal server that takes the serial data from the modems, handles the PPP translation, and creates Ethernet packets that then are routed through the Cisco. Then if you are doing a distributed architecture you have to have your servers down at the POP, and ideally you also put some kind of network monitoring like an RMON into your POP so you can do proactive monitoring.

So this is kind of a traditional POP. The thing I've always hated about traditional POPs is they have lots of wires. Yes?

M: The bank of modems you talked about, what is the ratio for a thousand customers?

Bob Berger: The question was, with a bank of modems what are the ratios to customers, the number of modems to number of customers?

That's kind of a business decision; it depends what kind of service you want to offer. It also depends on the scale. It turns out that as your customer base grows and as the number of modems grows, you start winning better with statistical utilization, meaning that if you have ten thousand customers, having a hundred lines will win, whereas if you have a hundred customers having only ten lines might lose. We are operating from about a five-to-one ratio to about an eight-to-one ratio, depending on the local customer range. We are still relatively small; we've got about 1200 customers.

With the traditional POTS POP — POTS stands for "plain old telephone service," and it's actually a technical term — ideally you still bring in the analog calls on the T-1. If you're going to have a bank of modems, they're in boxes now that you can get from U.S. Robotics that will take the T-1's in and demultiplex them, and then you have the bank of modems. From the T-1 you bring out twenty-four phone lines that go into the modem, [then] to the bank of modems — you have 24 modems. Then those modems have twenty-four RS-232 lines that go into the terminal server, and the terminal server then handles all the PPP translation and sends it off to the router, where it then is taken to your backbone operation or to the Internet.

This is also the model of a single POP. If you're just doing a single POP, you go directly to the Internet. If you're doing your own multiple POP architecture, instead of the Internet there, that would be your backbone.

[For] the POP that we use, we've built a modular POP that we believe is very scaleable. We push as many of the services out to the POP as possible, so when the customer tries to get their mail, they get it right from the POP; when they get their news, it comes right from the POP. That helps both in terms of the responsiveness to the customer, and it also helps us distribute the load so that a single point of failure doesn't wipe out all our customers. And as we add more POPs we add more capacity, so it is a really nice architecture.

Because we manufacture the POP we can deploy it rapidly. We just have a few standard POP configurations. We build them in our factory, and we can deploy a whole region in just a few weeks. We have just deployed into L.A., and the longest lead item was finding the real estate; actually deploying the POPs was done in just a few weeks. And we put out seven POPs. We also can support both analog and ISDN with the same hardware, and it has a lot of features for doing remote management.

So the kind of elements that are in our POP start out with the CSU/DSU and router that we use to backhaul the traffic over frame relay to our backbone operation. We then are using the Ascend Max, which is an ISDN hub router. This is a nice box because it can take in four T-1's that have ISDN signaling — which is called primary rate interfaces — and those calls can come in as either analog calls or ISDN calls. It has built-in digital modems to translate the analog calls, and it can support up to 48 simultaneous analog calls, or 96 B-channels of ISDN, or a mix of the two. So that's a nice box.

Then we put out a Sun Sparc 20 in each POP, and that handles all the mail and news, the DNS, things like that. And then we put a terminal server in there, mainly to be used for remote monitoring. We have all the console ports of all the devices hooked up to that terminal server, and then we can remotely log in either over modem or Telnet and access all the consoles. We also have a power control so we can reboot any of the devices remotely.

Then finally we have an RMON in there so we can measure the traffic both on the POP's Ethernet as well as in our backhaul T-1, so we can watch the traffic and can scale up the bandwidth as we need it, or add more capacity. And with POPs it's the real estate thing: it's location, location, location. The constraints are finding the twelve-mile radius that covers your territory in the most efficient manner, as well as finding the COs, the "central offices," that have the facilities you need. [For example], we need primary array interfaces. Then you want to find a place that's not too expensive; but it tends to be expensive anyway. So then that's pretty much the hardware picture.

In terms of the kind of services that you have to offer, it is basically the suite of functionality that is brought to you by TCP/IP. At the bottom is your connectivity options; we have gone through that, pretty much. You can supply any one or all of these services to your customer. You have to really think about the network design requirements; a lot of people get started just putting a UNIX server and a router in and they think that's all they need, and then they discover the multi-homed routing, the complicated internal routing, things like that.

And then [there's the] capacity planning. The worst thing that can happen is that you're successful; you know, you've got your T-1's, and now, oops — you need 10-megabit pipes, and that changes your whole network architecture. So you really have to think about, from the beginning, where you want to go and how you're going to scale it.

Peering is the issue we talked about of how you're going to get connected to other Internet providers.

The core of IP is, of course, routing. BGP is what you use for your backbone routing; I can't stress how important it is to have someone that knows how to deal with BGP if you're

going to have more than one connection to the backbone. As soon as you go from one to more than one the level of complexity of routing increases dramatically. And I have been surprised at how — there's basically, I get the feeling, a hundred people in the world that really know how to do it, and they all are scrambling continuously; they all have beepers, and they're all always just keeping the network running in the background. It's great if you can find someone that knows about that, or can connect you to someone who knows about that. Again, if you're going to have multiple POPs you need to have some kind of sophisticated [routing] — you can't use RIP. A lot of people put their networks together and they use RIP, which is the basic routing protocol that comes with most workstations and things like that. It is really easy to get started, but think of it as spaghetti routing; it doesn't scale at all. So you have to use something more sophisticated, like OSPF. Yes?

M: What about RIP Version 2?

Bob Berger: RIP Version 2 will be better, but I still wouldn't base my internal network on it. But you still need to do RIP for your customers; your customers can just use default routes to connect to you, but internally you don't want to be using any default routes or static routes, or just the minimum number.

Then you have to think about how you're going to allocate your IP addresses. For instance, each POP is going to have to have its own chunk of IP addresses, because you're going to want to set it up that how you route your internal network is based on what addresses are associated with the POP, and that boils down to allocating the addresses to your customers.

We'll talk a little about the domain name service system. If you are going to offer your customers the ability to have their own domains, that means you're going to be their domain name server; so if you're going to have a lot of customers with their own domain names, you have to have a very robust domain name architecture, so you want to have multiple servers and you have to really think about having lots of DNS files. We found — we were surprised, and we overloaded our directory. Normally you put all your domain name tables in one directory, and what happened was it exceeded [our directory size]; just the fact that the UNIX system had to go and do all sorts of work to just do a stack on that directory slowed down the whole domain name service. So you have to really think about the architectures of scalability again.

And you also have to worry about the reverse look-ups, and that gets back to how you manage your IP addresses. Mail is probably the most used service by your customers, and so you have to really consider it ultra mission-critical. You just can't lose mail; customers get really upset when that happens. That is one of the reasons why we both distribute our e-mail so that it is out on the POPs as well as use RAID disk arrays to carry the mail spools, plus doing standard backups on top of that.

So you have to put — it can't be a side thought. You will have to offer POP mail for customers that don't have a server at their site — which is most of the dial-up customers — so that POP mail allows them to dial up, connect, and kind of suck their mail down to their host. But you also have to support SMTP just for your own internal mail network, as well as [the fact that] some of your customers are going to want that. SMTP is the normal mail delivery system that is server to server.

UseNet News is another service that takes a lot of resources on the part of the Internet service provider but is considered an elementary service to the customer. You have to decide what kind of software you're going to use; there are the older ones, the B-NEWS and C-NEWS, and we are using INN, which has kind of emerged as a standard right now. That is a pretty big package, and you usually need a news wizard to really keep it running smoothly. You will also need to get news feeds, but that is a lot easier than Internet feeds. A lot of times your

Internet provider will give you a news feed, or you can find someone else who is well-connected to give you a news feed.

There are over twelve thousand newsgroups at this point, and the news spool is pretty big. If you want to keep more than a few days of news, you need just gigabytes of storage, and all the issues of having — basically the lights are always blinking on the disks for the news feed. So it turns out to be an area that can cause a lot of problems for a provider.

Then you have the case where if people start spamming and it happens that one of your customers is a spammer, that's always exciting... So you have to be ready for the fact that you might get deluged with mail and news messages.

M: What does "spam" stand for?

Bob Berger: The question is, what does "spam" stand for? I don't think it is an acronym, particularly. It is basically when someone sends a message to all newsgroups, [even though] that [message] has nothing to do with the newsgroup. That infuriates all the readers of that newsgroup, as it should, and then they will usually mail-bomb the spammer. And if the spammer is your customer, that means that you're dealing with the mail-bombs. I will talk a little bit about why you have to consider that when you do your terms and conditions.

What has emerged recently is that people are now expecting that as an Internet service provider you will also provide them with a place that they can put their Web pages. We are seeing a lot of people now including that as part of the basic service, that their customer gets 10 megabytes of storage on a public server at the Internet service provider's site. That is called a "shared server," where you have one or more servers that would have many customers' Web pages on it. This now kind of opens you up to — you're almost like a shell account for this, because people need to be able to potentially log on to that server to manage their files, things like that — so you now open yourself up again to having all the problems of a shell account, which is password management, hacking, managing resources, load balancing... But, on the other hand, the market is kind of demanding that. Hopefully we will see some tools that will allow people to remotely manage their Web page without actually logging on to the server. There are a few products out on the floor that let you do that.

People also tend to want to have anonymous FTP sites. It is not really too much of a problem to allow them to export or to publish files with FTP; it becomes a problem if you have an FTP site that people can upload to that's anonymous. We discovered that there are pirates, software pirates on the Net, that will find anonymous upload sites and use them as drop-off points; they will download gigabytes of illegal software onto your disk and then announce it to everyone, and suddenly you will first of all discover that your disk is full, and then [find that] you're getting this unbelievable traffic. So that's kind of one of the dangers of having open upload sites for FTP.

The shared server can be a nice business also. You can give people the minimal 10 megabytes, but then you can offer more robust servers or less densely populated servers for a charge, and charge people to put their business pages up there. Even nicer, if you have the capacity, is to sell co-located servers. Assuming you have built a robust network with some good bandwidth to your Internet backbone, and you have the space, you can rent space in your machine room where people can put in their servers and be connected to the backbone at 10 megabits per second. There is a nice economy of scale for both the customer and you to put that in; you can easily charge \$500 per month on up for that kind of service. Of course, it is another business, so you have to be ready to support that business.

And then of course everyone wonders about security. As an Internet service provider, the most you can really do is practice good Internet hygiene. You have to be on the Net; you

can't put your servers and things, your public servers, behind your firewall. But you can do things like packet filtering; As a matter of fact, you really should do packet filtering, so that you protect your customers from "spoofing." This word spoofing — where people will change the source address of packets and be able to sneak them in as pretending to be someone else — that is a very easy thing for you to protect against by just putting particular filters into your routers.

The other major thing you should do is use what's called "TCP wrappers." For all the services there is a package called TCP Wrapper, and it allows you to control who can access what service as well as be able to log every access to every service. It doesn't really stop them, necessarily, but it at least gives you the ability to know if you are being hacked, which is the first step.

You, of course, want to firewall your own internal applications, but the servers and routers and things like that that are public can't be firewalled. You want to internally use some kind of encrypted password system, *Cerberos* or *NIS+* or something like that, so it at least means your own internal passwords or something like that aren't always flying around in open air.

And in terms of services, you can offer to your customers firewall services if you have the expertise. Or, if you don't have the expertise, find someone who does and use them as a partner, because your customers will always be concerned about security. There is not much you, as an Internet service provider, can do yourself except what we have talked about; but you can offer them kind of hand holding to secure their own network. In the future I think we are going to see some standards that allow all the packets that go across the Net to be encrypted. Yes?

M: Can you talk about *Cerberos* versus *NIS* versus *Radius* versus *TACACS*?

Bob Berger: I think it depends what you're doing. The kind of architecture we have, where we are using routers as the access point, kind of makes us use either *Radius* or *TACACS*. We use *Radius* because that is what they supported at the beginning; and that is actually a pretty nice package. *Radius* is what allows for when people connect to the router with PPP, the router is presented with their user ID and password. The router then needs to know that is this a valid user, so it queries a server called *Radius*, or *TACACS* — a server that runs on the UNIX system, that has the actual database of user information — and then [this server] will report back to the router that it is valid or invalid. It turns out it also can be used to control all the parameters on a per-user basis with the router.

TACACS is an earlier version of that, and it sort of doesn't have all the features of *Radius*. They now came out with *TACACS+*, but I am not familiar with that. And *Cerberos*, I believe, is more an infrastructure that can be used throughout your network to carry security information; and *Radius* can actually interoperate with *Cerberos* for a kind of hierarchical authentication. But this is getting into a pretty sophisticated arena.

As I was saying, the encrypted packets I think are going to be kind of the savior of security on the Net; where people will be able to create virtual private networks between users by encrypting the packet stream between the users, so that prevents snooping and assures authentication of traffic. There is some standards work being done by the IETF to standardize [this] in a particular way. Today you can buy custom or proprietary things from a variety of vendors; I see some of them on the floor. But it will really become useful when it is a standard and it will be embedded in the stacks and the hardware.

[There's] something that when you first get started doesn't seem like a big deal: setting up user accounts. Just edit some files and they're set up; but when you start getting down to

[the point where] you're adding twenty users a day, or a hundred users a day, that doesn't work real well. Just the volume becomes problematic, and the amount of errors that are introduced starts being a contributor to your tech support load. So you really want to create a system — and unfortunately today it's pretty much that you have to create the system, as opposed to buying a system — to manage the whole order-entry process, the whole customer setup, password management, billing, clocking of the usage, allocating address space, setting up the mail... It's a lot of things you have to do every time you add a user, and you really want to automate that.

The *Radius* database I mentioned does generate billing information, so it actually produces start and stop records and durations; but you still need to be able to process that for billing, so you have to be able to [track it]. Basically the *Radius* database on each POP is producing megabytes a day of billing information, so you have to be able to cope with that stream, kind of bubble it down and port it to a billing system; and then there's the usual billing the customer, collections, and accounting systems... So this gets back to [the fact that] you're going to have to somehow bridge the internal operations to the normal accounting operations, so that's an area that we found to be a big investment.

Legal issues. Being a techie you sometimes forget about these, but they're really critical. Terms and conditions are really important. It kind of gets back to the issue we talked about, [the issue of] spamming. If it turns out one of your customers did a spam, and you didn't have anything in your terms and conditions that said you can't do that, you'll be open to being sued if you kick them off. But if you think about it, there's two things: one, think about the things that can happen like this; and the other is that as an Internet provider you have to think about some of the weird things people are going to do on the Internet, and [decide] if you personally feel okay about it. If you don't, you should put that into your terms and conditions too.

It is really important to talk about netiquette; you really want to be able to enforce that. If you do a terms and conditions, make sure your customers see it, and ideally somehow accept it — though a lot of people are just using kind of a shrink-wrap approach on that. And then I also strongly recommend getting real lawyers to review the stuff, to review your corporate stuff, your incorporation papers. If you are doing anything larger than just a small little POP, you really want to make sure you have some legal counsel on how you set things up. And it is worth investing that up front [rather] than later.

In terms of finance, in building an Internet service provider you're basically being a phone company; it is a utility and you have to invest money, and a lot of money, before you will really start getting returns, potentially. I strongly recommend having an experienced accountant/controller/CFO type person, at least as an adviser if not on staff. There are a lot of business issues that are as sophisticated as the technical issues.

And again, capitalization. Most businesses fail for being undercapitalized. It is real easy to go into this thinking "Oh, I can do this on my Visa." It's really — it's a big deal if you're going to do anything larger than one or two POPs. It's just very capital-intensive. We are just about to complete our first outside round, and we're raising five million. We put up about three million already.

M: Eight million dollars for twelve hundred customers?

Bob Berger: Yes. We just closed the second round for the expansion. The question was [a statement of] surprise at us raising eight million dollars and having twelve hundred customers. The thing is, we built our infrastructure to support ten thousand customers. That's why I'm saying that you have to spend a lot of money before you get a lot of money. If you are —

M: Even at ten thousand customers, that's \$800 per customer. If you're getting \$30 a month, it's going to take you six years to recoup your money before expenses. Doesn't make sense.

Bob Berger: He's debating on the wisdom of how we have done things. Basically, this is part of my point.

You have to spend money to be in play. You have to build a much greater architecture than you think you do. In other territories you might be able to get away with being a smaller provider for a while, but the market is accelerating so rapidly... I'll go into that in a minute.

Actually the next item, the national ISPs — the people you see here, PSI, UUNet — their capitalization is at somewhere between 40 to 100 million dollars, and none of them are making any profit above their expenses; they are all building out, and that's kind of what you have to do. And we are about to see the entry of the RBOCs and AT&T and those kind of people, and they have got billions.

So we're going to see — there was a niche in the past where you could sort of bootstrap your way in; I mean, NETCOM started in a guy's living room. That's past. It's just like the semiconductor cycle; you might be able to find some niches in some territories, but it is very rapidly becoming a capital play. Yes?

M: Do you think it is a good idea or a bad idea to offer services or resell hardware or equipment to your customers?

Bob Berger: Good question. The question was, is it a good idea to resell hardware?

M: Or to do services, setting up their own Internet access.

Bob Berger: That is actually inherent in our model. We developed basically a two-tier distribution where we sell through VARs and resellers. We sell all the hardware as well as software and services, and then the VARs also can sell their own integration services. Is that what you're asking?

We'll also talk about something else at the end. In terms of business issues, as I said, the technology is only a small portion of doing an Internet service business. Sales and marketing, finance and operations are as important, or more important, especially as we have now transitioned from the early adopters to moving to more mainstream. You just have to have complete support and operations; it is a full business. You have to be able to manage resources. And the market niches are being filled really fast. This has to be the fastest-moving industry I've ever seen; it makes the PC revolution seem like it was in slow motion.

I mean, I don't know how many of you people were at the original Internet World, which was only two years ago, but it was like an amateur event. And you can see what kind of activity is there now, the kind of players that are in it. It's no longer one that can really support much bootstrapped operations.

And I have found personally that people issues are a big one. I mean, this doesn't have as much to do with Internet as with starting a business. The technology is much easier than people; people are much more complicated. It's really important to choose your partners well. It's really easy, if you start something with a friend, that they might not be your friend for that long.

You also have to be really concerned about stock. In a startup company, stock doesn't seem like that big a deal; you know, your friends say that they'll contribute all this stuff... And then if you're the only one putting in capital, you really have to tie stock to capital. Stock options are really good as an incentive mechanism.

And then, finally, it's really important to get the best people. A lot of people think they can save money on people, but you always want to hire people smarter than you, especially when you're starting a business. People are going to have to do a million things at once, so you need people that can really excel under pressure. In terms of people, just in terms of numbers of people you need, just to give you an idea, I think your network operations and tech support really has to be robust to begin with. You have to very quickly go to 24-by-7 support, so that works out to something like seven shifts at least. You really need seven NOC operators at the minimum, and you need to have some really strong network engineers.

We talked about the issues of routing; I mean, news and mail can be almost full-time. Again, it really depends on your scale, but the 24-by-7 becomes kind of a nut that is incompressible.

Tech support is an area that can grow without bounds. Two is really the ultimate minimum, but as your customer base grows your tech support load can grow. And the more you can invest in other things like your automated turn-ups, and software that makes it easy for people to connect, that will reduce your tech support growth. But people perceive your company by who they call on the phone, and what kind of response they get; so that really is kind of the goodwill of the company, how good your tech support and customer service is.

Customer service is more the non-technical support — the billing questions, changes, resolving problems. So you need to again have a certain scaleable number of people to do the customer service.

Sales is an area you have to invest in, because again you want to boost your growth. Your question about the size... One of the mistakes was that we invested a lot in getting the core network and didn't invest the same time in sales, so the sales didn't follow or didn't parallel the buildout. You really have to invest early in the sales and marketing, [and have] at least one excellent person plus outside services. And that is going to have to grow as you grow.

Finance and operations; I was surprised how big that was. You generate a lot of paperwork, a lot of billing, and a lot of purchasing. Including the CFO, it's a minimum of three people. And it can expand.

Then [the amount of] time [from starting up] to market. From the point you decide that you want to start doing this, there's a lot of things that take longer than you expected. I believe it can be easily six months from your start to when you're really going full bore. Again, it depends on the scale; if you are doing a single site, that can be brought down significantly. When you are doing multiple POPs you have to really worry about the real estate, getting the telco to get the lines in — that always takes a lot longer. Getting them to work takes a lot longer. I was amazed at how the phone companies don't have it together. The one hope that the phone companies won't take over the Internet is [because] they don't know how to do data.

And [then you have] the business issues, setting up the accounting. The more you can do that up front, the accounting, the customer turn-up, all that stuff, the faster you can grow and the better your quality of service is.

So I end [with the question], are you really sure you want to be an Internet service provider? It's a lot tougher than it seems at first blush. One of the things that we have come up with that is kind of interesting is [the fact that] we have done so much of this work, we are now starting to OEM a lot of the architecture we have done. We are right now focusing on mostly out-of-the-country opportunities; but if anyone is interested, they can contact me at this address and talk about OEM possibilities, where we have a lot of this stuff turn-keyed.

But good luck to those who really try. It's exciting and it can be fun, but it is really challenging and there will be some ups and downs. So thank you; if you have any questions, we

can take a few minutes to answer questions. If people could come up forward, if they want to ask questions, it would be better.

M: Will you be publishing any of your graphics on your Web site?

Bob Berger: Yes, they will definitely be published in the CD-ROM, and I will do my best to put them on the Web as at least an FTP; it's a PowerPoint presentation. Thanks.

ACCESS PROVIDERS

INTERNET ACCESS PROVIDERS: A BEGINNER'S GUIDE



SPEAKER

Joel Maloff

President, The Maloff Company

Joel Maloff: Good afternoon. I think we will get started now. For those of you who are just coming in, I think there are one or two seats left, so we might be able to find a place for you. I have never spoken in a circus tent before, so this ought to be an experience.

I want to welcome you to this afternoon's session. My name is Joel Maloff. I am a consultant. I have been involved in the Internet business for quite a long time, having been executive director of the Big Ten university research network for three years and a vice president of sales and marketing for Advanced Network & Services, one of the largest Internet providers at the time in the United States. So I have been involved with this for a while.

For the past two years, have been acting as an Internet consultant assisting end user companies that are looking to use the Internet for business purposes and additionally assisting what I refer to as Internet access provider wannabes, companies that are trying to get started as Internet providers. So I have worked in a variety of different ways.

The session we have planned for you this afternoon consists of three portions. The first portion is my comments as a consultant talking to you about what to look for as end user organizations in picking an Internet access provider. What do you need to know? What do you need to understand in order to compare apples to apples and be able to understand the value from various providers? That will last until about 2:30 or about an hour or so.

We will then take a break and then come back and have a panel of distinguished Internet access providers in fact from around the world. We will have the vice president of marketing of UUNet Technologies. We have one of the key directors of BBN Planet. We will have one of the key personnel from Pacific Bell, a regional Bell operating company. We have an Australian Internet access provider and a Canadian access provider. Each of them in the second session will have an opportunity to present their own views on what you ought to be looking for in their opinion in picking an access provider. They will tell you a bit about themselves and they will tell you a bit about what they think is important.

That's the second session. And then in the third session we think we are going to have a little bit of fun. I will come back and act as moderator. Each of the same providers that I mentioned a moment ago will be on the panel and we will throw them questions. You from the audience will have the ability to do so as well. Each provider will have one minute to answer that question. And heckling is encouraged, from you, or the other panelists. And depending on how it goes, if it's not too bloody and I'm not in a benevolent mood, we will decide at the end who we think won.

The idea is to have a bit of fun but to give you the opportunity to see something that you don't often see, and that is access providers standing up against one another. So instead of comparing apples to oranges, you will hear what they believe their arguments are and how they try to refute one another.

That's what we have planned for this afternoon. And in my presentation, as I mentioned, I am going to be talking about my views as a consultant and how I have assisted people in selecting Internet access providers. There are three major areas that I am going to cover: what the Internet is from an access provider's standpoint and how it is important to you as end users; who the different types of Internet access providers are.

And you often hear people use the term "Internet Access Provider" and mean it in a very general way. My view is very different. There are a variety of different types of Internet access providers. It is important for you to understand their different strengths and weaknesses.

I should add, by the way, if you haven't noticed already, I'm in the holiday spirit. All of my slides are in Halloween colors. I couldn't find an icon of a pumpkin, otherwise I would have used it. But I thought it would be nice to at least remember today is Halloween. And I'm not in costume!

The second part of my discussion will be, what are some of the services that access providers might offer and how are they important to you, so that you again know what are you looking for and are you comparing apples to apples. And the last portion is to talk about some of the specific qualities and traits that different access providers have.

So these are the topics that we have planned for your discussion today and, again, as I mentioned, I think it will get interesting as you get an opportunity to hear after I present a consultant's view what the access providers think and then have them have the chance to go head to head with one another.

One final comment before I launch into the comments. Many of the comments that I make are in my new book that has just been released, *Net.Profit*. It is available on the show floor at the Quarterdeck booth. I have tried to again provide information in the book from a business perspective: what businesses are looking for, how they are looking to use the Internet, and then how do you go about obtaining Internet service.

That's the commercial for the book. No more on that. Let's launch into what are you looking for when you're picking an access provider.

I'm sure you all think you know what the Internet is today. We have been talking about it for the past several days at this conference and it's gotten an enormous amount of hype. What is important to recognize is that the Internet is not a thing. In fact, in many of the sessions that I do I will ask the question: Does anyone know who owns the Internet? Occasionally someone in the back will jump up and say "God!" It gives a whole new perspective to routing problems when you think about it.

The fact is no one owns the Internet. The Internet is a network of networks or a community of networks. It works because each of these individual Internet access providers agrees to interconnect with one another. In the earlier talk this morning you heard about the various kinds of meet points, NAPs, Network Access Providers, the Commercial Internet Exchange. These are places where these Internet providers connect with one another. So it is important to remember that the Internet is a community. There is no one provider that offers Internet access everywhere in the world, so it is important that all of these providers connect with one another in a relatively seamless environment. We'll talk about how that occurs in a bit.

When I look at Internet access providers, as I mentioned in my opening comments, I see a variety of different types of providers. The first category that I will talk about are those providers that I classify as backbone-oriented. What this means is that they have multiple nodes or sites that they have connected to themselves using private leased lines. In the case of the slides you can see Advanced Networks & Services, ANS, my old company, which was acquired by America Online. They had for a while the backbone service that was used by the National Science Foundation. It consisted originally of thirteen and then ultimately eighteen nodes throughout the United States and finally extending into Hawaii. Each of these was connected to one another so that if you were connected to ANS in Boston and wanted to communicate with someone connected to ANS in Washington, you would be communicating entirely through the ANS network or on-net. If, on the other hand, you wanted to communicate with someone that

was connected to UUNet or BBN Planet or to MCI, you would have to go through one of these meet points or connections that I referred to.

So when we look at how Internet service providers design themselves, we look at what kind of on-net or backbone facilities they have.

This is a listing of some of the major backbone providers that are there today. A year ago there were perhaps three or four. Now there are many more. As you can see, ANS/AOL is still there. AT&T has recently announced backbone services, as has IBM. PSI and UUNet have been around for a long time; they are the oldest of the commercial Internet providers and recently both have announced aggressive expansion plans internationally.

One of the trends that we are seeing — I mentioned this in some comments I made in another talk yesterday — is a move towards domestic American providers extending internationally. If they do this on their own, it will be somewhat difficult. If they do it in partnership with others, I think we will see a much broader global explosion. That's already starting to occur.

Some of the others that you can see, NETCOM has been around for quite some time, and CompuServe. Now, I am going to talk about the on-line information service providers as a second category in a second. But I believe you should look at CompuServe as well a bit differently. It is not all that well-known, but CompuServe has had a private network division offering frame relay private corporate networks for some time. That has given them a leg up on some of the other Internet providers and some of the other on-line service providers that haven't done that kind of work in the past.

So again you need to look at the types of providers, what kind of network infrastructure do they have. And again just because a company has fiber optics as does an AT&T or an MCI does not mean that they have Internet nodes everywhere. It is important for you as end users to understand, how are these networks architected? Where are you going to be able to connect? How robust they are?

That's one type of provider. The second type of provider comes from the traditional research and education background. These include networks like CERFNet, the California Education and Research Foundation Network; Colorado SuperNet, VJNCNet and my old network, CICNet.

It's interesting. For those of you who have heard me before, I apologize for this, but I am often asked what CICNet stands for. It actually stands for the Committee on Institutional Cooperation, which was the Big Ten universities minus Purdue, plus Illinois and the University of Chicago, and that's a mouthful, so we chose to call ourselves the Committee on Institutional Cooperation. But again as you might tell with networks like CERFNet, NEAR Net, FAR Net, BIG Net, we tend to alliterize the names of our networks. We try to decide what we should pronounce our name as. The first choice was, we thought we would call ourselves KICK Net but some of our board members didn't like the idea of being kicked around. The second choice was SICK Net. Didn't seem like a good idea for a robust network provider. Third choice was CHICK Net. Lady board members had a problem with that one. And the last choice was SHEIK Net. One of our members is Iowan, went to undergraduate school in Iowa, and I think of hogs and corn, hardly chic. So we settled on calling ourselves CICNet, and got an award as the least creative name of a regional network.

These networks mostly were formed by academic computing centers of universities and were meant to serve students, faculty, researchers and staff. That comes from the mission statement of my network. Many of them tried to become commercial, and in the case of BBN Planet they have succeeded. They have actually taken former research and education networks and molded them into a business. Many of the other ones have not. And it is important when you are looking at Internet access providers to look at historically where do they come from,

what are their strengths, what are their weaknesses. Most of these providers tend to connect to other backbone providers. They may have a small regional backbone but certainly do not have a national or international backbone as the others that I have alluded to earlier.

Then the next type of provider is what I refer to as an Internet reseller. These are providers that do not establish their own backbones but rather buy capacity from a major backbone provider such as Sprint or MCI or Net 99, [ANS], which again was mentioned earlier. These are firms that will buy a connection into that access provider. Again, no backbone but they are reselling someone else's capacity.

So it is important to understand, how are they connected? Are they connected at one place? And think of this, for example. If I am an Internet reseller such as North Shore in the Boston area or Digital Express in Washington and in New York or DataBank in the Midwest, if I have a connection into Sprint and that connection fails, all of my customers are partitioned; they are no longer connected. There is no backbone. So the question to ask an Internet reseller is: How redundantly connected are you? Do you have connections to more than one backbone provider? Are you connected to Net 99 and MCI or Sprint or ANS? How are you connected? What bandwidth are you connected at? How robust is it?

As an example, there have been many people at this conference talking about how to start an Internet access provider. I have even seen companies talk about how you can acquire a 56 or 64-kilobit per-second connection and then sell 56 or 64-kilobit dedicated-access connections to your customers. I don't know how you can do that very well. What happens if that connection is cut? What happens if all of them are using it at the same time? Again, you as end users buying capacity need to understand what type of provider are you dealing with. Each of them has different characteristics and different advantages. We'll be talking about those as we go through.

In addition to the backbone providers, in addition to the research and education and Internet resellers, there are also a variety of other providers that are looking to become active in Internet access provision: Internet exchange carriers. These are the long-distance companies. We haven't yet seen an aggressive approach from cable and wireless, but I believe we will. LDDS/Wiltel is a major national and international facilities provider. They will be very aggressive. I believe both of these will be offering Internet access services.

But one of the points I would caution you on is that offering Internet access is not the same as offering point-to-point circuits or dial-up voice. It is not circuit-switched, it is packet-switched. Which is very different. As an example, Sprint has been involved in offering Internet access service for three and a half or four years. I do a series of research reports and I know that early on in the first twelve months Sprint offered only dedicated access, had a total of about thirty customers, three zero, after twelve months. After twenty-four months they had about seven hundred and after thirty-six months they had about fourteen hundred.

The point is I know the time has changed, the market has matured. But the learning curve to train your sales force if you are a telco and large is quite lengthy. Think about it. If you have ten thousand salespeople and you can train thirty or sixty a week, how long will it take you to train every one of your salespeople? And let me assure you, selling TCP/IP and Internet-based services to business is not easy. Not all of the salespeople out there selling telco services can spell data, let alone sell it. Sorry. I was one of them.

It is important to understand what you are selling, and I believe there will be learning curves. In addition to the interexchange carriers or IXC's there are local exchange carriers looking to be active in the Internet provision business. These include the regional Bell operating companies or internationally the PT&Ts, local phone companies who want to be able to offer these services. In all cases the learning curve is likely to be larger, longer than they think it will be. It is important for you as consumers to be educated consumers, know what you are asking

for and be able to compare apples to apples. We'll talk about what to ask for as we go through this presentation.

In addition to the telephone companies, the regional Bell operating companies or the large independent telcos here in the United States or PT&Ts worldwide, there are also what are referred to as alternate access providers. These are companies that build fiber-optic or microwave bypass networks that will bypass the local telephone companies. Perhaps the best known is a company called Metropolitan Fiber Systems, MFS. They have built bypass fiber-optic facilities in more than twenty cities in the United States and several internationally. You have the ability to connect to these providers and bypass the local telephone company. It is a simple matter for Metropolitan Fiber Systems to connect via leased line their New York-Boston-Washington-Chicago locations and create their own closed private network that never touches the local telephone companies. So it is important to recognize these kinds of providers are emerging as well here in the United States and internationally.

Lastly we need to look at the cable television companies. They already have embedded plant, physical facility. There have been tests going on for Internet access for more than three years. Continental Cablevision here in Massachusetts, Jones Cable in Alexandria, Virginia. The cable modem is becoming more effective now. It works. The price is coming down.

Again, there will be a learning curve. People who operate cable-TV companies don't understand a whole lot about how to do interactive services, especially something as complex as the Internet. Nevertheless, they will be offering services. So you've got all of these different types of providers out there.

In addition to that, you have the information providers, America Online, CompuServe, Prodigy, and Delphi. It is interesting to note, perhaps three years ago the on-line service providers had a choice: Do we try to resist this Internet thing that is developing or do we try to embrace it and become part of it? And it is very clear that in most cases they have chosen the latter.

Today CompuServe is part of the Internet. America Online is part of the Internet. I do a great deal of work internationally. I was in Manila in the Philippines not too long ago. I had the ability to log into a local Internet access provider in Manila, bring up my connection and then bring up my America Online software, indicate that I wanted to use TCP/IP to connect, and I was into my America Online account, able to read my mail just fine, even though America Online offers no access service at the moment outside of the United States. And yet I was able to use it.

All of these services are becoming part of the Internet. America Online through GNN just announced a stand-alone Internet service yesterday. CompuServe has had one for some time with SPRY. Again, all of these providers are now part of the Internet. You have options. You have choice.

What is critical for business is to understand as you look at this melange of providers, what am I looking for? Am I looking for ease of access? Am I looking for technical proficiency? Am I looking for multiple locations around the world? I have a company, I have branches in twenty cities throughout the United States and ten countries internationally. I want one provider that will help me use those. How do I pick? Today there are a few providers that can offer you some of that service. Arguably, there is no provider that offers access everywhere. So again you need to look at the different types of companies that are offering service. Do you want to use a small entrepreneurial company? Or do you want to use a very large company? And just because they're large, just because they have large amounts of fiber in place or satellite transponder time does not mean that they are proficient in Internet.

Again, you need to explore that and understand it. I'm not asserting they are not. The point is, don't assume that they are.

I think it is important to understand that there are different types of connection. I know this is basic but it is important to understand that not all providers offer all types of service. There are two basic types of Internet connectivity service: dial-up, which comes in dumb and smart varieties; and dedicated access.

Some providers offer only dial-up service. Mostly these tend to be smaller Internet resellers. Some large providers, such as my old company ANS or Sprint, only offer primarily leased line or dedicated services.

Again, it is important to identify what is important for you. Are you looking for a dial-up account that is inexpensive, relatively easy to use? Are you looking for a business- quality account? Are you looking for support from people to help you understand not only how to use it but where to look, what resources are there? What are you looking for?

If you are looking for dedicated access, do you have a need also for dial-up services? Again, I think it was an almost fatal flaw for ANS and Sprint not to offer dial-up services because there are many, many businesses today that are looking to use dial-up services as a way to try it out and then move into higher-bandwidth leased line services. As an example, I mentioned the Internet report that I've done in the past. Between 1994 and 1995 SLIP, Serial Line Internet Protocol, or smart accounts in the United States grew an average of 35 percent per month compounded. Leased line services grew at 7.1 percent per month, down from 13 percent a month a year ago.

Again, I attribute this to having saturated most of those businesses that knew what they would do with a leased line connection costing ten, twenty, thirty thousand dollars a year by the time you add in all of the costs of going to dial-up accounts. I have many very large clients, life insurance companies, for example, that have no direct Internet access but they have thousands of dial-up accounts. What is likely to occur over the next several years is what I refer to as the pig in the python effect. All of these people using dial-up accounts for business now are going to migrate into leased line or dedicated access services over the next several years. We are going to see this continued growth and pulsing, rippling effect as dial-up and dedicated access move back and forth.

Again, it is important to understand that the dial-up services I am talking about are not the traditional residence/consumer quality. These are businesses who might buy fifty or a hundred or a thousand dial-up services at a time in multiple locations around this country and around the world.

You as an end user need to examine what are my requirements? What am I looking to accomplish? What kind of provider do I need? What qualities of service am I looking for?

I mentioned the report that I've done, and it is actually available on-line. It is a bit dated now. The research was done in February of this year. It is available. The executive summary and table of contents are free of charge. The report is downloadable using First Virtual capability. For the most part, unless you really, really need it, I don't suggest you buy it right now, it's changed so much.

But the point is there is information out there. I still get requests from around the world, even though I tell people the information is fairly dated.

Now, again when you are looking at access providers, remember that there are a variety of providers out there, everything from the BBSs that are Internet resellers and offer dumb shell accounts, text-only, to more graphical interfaces using Mosaic or Netscape and offering you those tools. What is it that they are providing you when you sign up? Do you get shareware tools? Do you get a professional package? What are you receiving when you sign up?

What kind of services do they offer? Are they offering FTP, Telnet and e-mail? Not all providers today offer you all of those services. You might wish to use Telnet but find that your provider doesn't offer it. Again, it is critical that you think through before you go to an access

provider and say what's your price, to ask, rather, what do you offer? What are the services that I can obtain? Do I get all news groups or do you in fact limit the news groups that I can reach?

I may want to do a variety of research work and I may want to receive all fourteen thousand news groups. Does your access provider offer feeds for that? Do they offer you the ability to manage your ListServ capability, again using notes, or Gopher, or World-Wide Web? What is it that the provider offers to you?

You can read about all of these. I'm not going to belabor the point. It is important to identify that there are many resources out there. You need to know what's useful for you.

Again, if you are looking for a provider, when they offer dial-up you need to ask: Is it UUCP? Is it SLIP? Is it PPP? Is it a shell account? Is it ISDN? There were some interesting definitions as to what ISDN meant this morning. The one that I always liked was "It still does nothing." The fact of the matter is after about fifteen years it actually does do something, but you can't get it everywhere. I happen to live in a rural area in Michigan. It's a great place to telecommute from. I do a lot of work there. But ISDN is not available.

I will tell you, however, that I was able to log on to Ameritech's Web server, identify my area code and exchange and find out that it wasn't available without ever having to ask somebody. I know I got my information a lot more quickly than if I asked someone at Ameritech for ISDN availability.

Leased line service. If you want leased line services, what bandwidth does the provider offer? And then at this point it becomes critical to know what bandwidth do they have going out? Again, if you want a 56-kilobit per-second connection and that's the only type of connection that your provider has going out from him to somewhere else, what good is it?

You need to understand how robustly they are connected. Again, if you are a business, you want to have a migration path. If you gain access to 56 kilobits, do they have access to the next level, fractional T-1, full T-1, 10-megabit or T-3? Again, all of this means that you as a business need to think through your requirements first, recognize that this is a business planning process; explore which access providers can meet your needs; get proposals from them on those needs, addressing each of these areas.

In addition, when you are obtaining service from an access provider you want to know what other kinds of services do they deliver. If I give you a dial-up account and you are a new user, a novice, you need some sort of interface. Am I giving you shareware services? Am I giving you Trumpet WinSock? Am I giving you Eudora in a shareware version? Or am I providing you Internet in a box or Quarterdeck's Internet suite or FTP's software or NetManage from the Chameleon package? What are they providing? How well is it supported? What kind of support services do they offer?

Another area we look at is posting services. This is a whole separate topic area. But if you are looking to establish an anonymous FTP server, a Gopher server, a Web site, you may — as many businesses are today — look to outsource that so that does not even sit on your property. What is important about this is that if you have a host, a Web server, you must have dedicated connection to that server. A Web server doesn't work with dial-up very well. The last thing you want is someone getting "network not reachable" or "domain name service lookup failed."

So what many companies are doing is outsourcing this and saying to vendors I would like to put my Web information on your server. You are responsible for making sure that it is secure. You are responsible for making sure that there is sufficient bandwidth. All of these issues.

Now, it is interesting. I often have people in these sessions say, well, if I put a Web server on the end of a 56K and it is not connected to anything else, I really don't need any other security. I mean, what can anybody do to me?

I don't know if any of you saw the *USA Today* news yesterday, but last Thursday Rodney Dangerfield's Web site was hacked into and somebody replaced Rodney's picture with a picture of a naked woman. They didn't say whether or not the lady looked like Rodney or not. Whatever. He's still not getting any respect.

The bottom line is, your Web site can be hacked into. All of these things are important, so when you are looking at services that you require, you need to consider all of the factors that go in. Am I going to host it myself? How much bandwidth am I going to need? What applications am I going to be running? All of these things get back to looking at this as a business issue, with the tools being some of the available services from within the Internet. So it is important for you to start with, what am I trying to accomplish and then, what services do I need from the providers that I am exploring?

The last one on this slide is training. If I deliver a T-1 to your site, am I going to assist you with training? Am I going to help you with configuring it? What services do you need? If you are a brand-new user and you're getting a SLIP account, will I come in and train your one hundred people that bought accounts from us? What kind of services will I offer?

And they don't necessarily have to be free, but they do have to be available if you need them. Again, it is important for you to understand, what capabilities do you have? What requirements might you have? And what are you looking for from your Internet access provider?

In the panel that we are going to have after our break you will have several Internet access providers from all over the world that will describe their view of their services. Remember, the Internet is a business tool. And it is my perspective as a consultant that it ought to be driven by you as the users. And rather than these providers coming up with technologies looking for a place to sell them, you need to identify what your needs are and explain those to the providers and let them respond to them. That works best, rather than just simply saying "Give me a quote." Because then you will have all sorts of apples and oranges; you won't know which compares to which.

Each of these providers has a different scope of services. First of all, do they have a clear and easy growth path? If you are looking from a business perspective to buy dial-up services with a plan for moving possibly into dedicated access or closed user group capability where you have a private network within the Internet — which is possible — does the provider that you are looking at have these abilities? Can they grow into dedicated connections later on?

Again, you are looking for a provider that is extensible and that is compatible with your growth plans.

Do they have 24-hour by seven-day-a-week management and monitoring services? Let me assert to you that one of these beepers does not constitute 24-hour service. It is important for an access provider who is business-oriented to have the ability to monitor and troubleshoot and be able to correct routing anomalies, loss of connection and so forth, before you even know you have a problem. And it has to be 24 hours, seven days a week, because the Internet is global; it is worldwide. You may very well have people looking at your Web site from Australia or Hong Kong or India. It is important that that service be up all the time. You may have researchers that are working at 3:00 o'clock in the morning. The last thing you want is someone to be in the midst of a very extensive FTP download and have the circuit fail, have the service go out. That simply isn't acceptable in a high-quality professional business environment.

But you need to ask these things and you need to ask, what constitutes 24-by-7 service? Does that mean that you have people on-staff? Are they doing active monitoring, active testing?

Are they waiting in a reactive way for someone to call? What does 24-by-7 mean to your providers?

Customer-service orientation. You know, it's interesting. Most of the Internet access providers who were around early on, the research and education providers, some of the backbone providers, all came from a very technical perspective. Absolutely fabulous technically. You want to talk about BGP? They can talk about that all day long. You want to talk about CIDR? They'll talk about that all day long. But if you want to talk about how do I find that archive somewhere else, "Look, you're bothering me, go away, I don't have time for this. Go talk to somebody else or buy a book."

That is not a customer service orientation. We're a business now. The Internet is an industry. You as end users have a right and an obligation to demand service, and that means they must have people to support you. It is expensive to do it properly, but I see no other way.

Customer service is going to make the difference in which access providers win and which access providers lose. It is important for you to drive that. Domain name service registration. You want to use xyz.com as your Internet address. Well, how do you go about registering that? Can someone help you do so? You want to know, can they assist you in that process?

You have a new product line. You want to have a unique demand based on that product line. Will they assist you? How much does it cost? Will they charge you for it? Is it then transportable? My address is Joel@maloff.com. If I don't like my address, I take maloff.com and go somewhere else. Can you do that with the domains that are provided to you? Again, how supportive, how responsive are they to your needs? Do they make suggestions? Do they tell you how they can assist you or do they simply say "Here's my price list, good luck."

Again, I believe that this is a business and you need to demand quality from the providers.

Announcement of Web sites. If they are going to host your Web site, recognize that just because you have a URL Web site address does not mean that Yahoo or Web Crawler or Lycos or All-In-I or any of these other search tools know you are there. You need to be announced. If they are going to host your site, will they assist you in announcing the availability of your site to these various tools? Again, looking for how easy are they going to make it for you. How much are they going to work with you in assisting you to make the transition from startup to implementation?

The last point on this slide I think is absolutely critical. Again, as I mentioned in my opening comments, the Internet is a network of networks. It only works if each of these network providers meets, connects, and interchanges their information and routes with one another. Now, these meet points are the Commercial Internet Exchange. The network access points, or NAPs, Mae East or Mae West or other bilateral connection points, or a BBN Planet, might meet with an ANS or an MCI might meet with UUNet and exchange their routes.

Again, remember that the Internet only works because these networks connect with one another. When you are looking at picking an access provider, especially for business purposes, how well interconnected is your provider? For example, are they connected at the Commercial Internet Exchange, exchanging their routes at that site in California? And are they connected to Mae East in Washington or a network access point in Chicago? Or are they connected in all of these?

From my perspective as a consultant there are three places that congestion can normally occur within the Internet. Remember, when you hear people saying the Internet is congested, I don't know what they're talking about. There is no one backbone. The three places are on-net within the existing Internet providers' structure. The modems are busy, their circuits are busy. That is one place where congestion will occur.

The second place that congestion will occur is at these meet points, where they are trying to pass their traffic. So, again, do they have redundancy? How many of these do they have?

And then the third place that congestion occurs is at the destination sites. If Yahoo is very busy or Lycos is very busy, it doesn't matter what the rest of the net is doing; that server, that site is heavily trafficked and you will experience delays. So again try to understand how well-connected the providers that you are examining are to the Internet as a whole.

Another point that I believe is important is personal compatibility. It is very important to understand the type of provider that you are dealing with. If you have been using AT&T you have a Tariff 12; you're very comfortable with dealing with them. Again, you want to ask hard questions, but it may be a no-brainer. You've already got connectivity into them, it works; that's fine, let's do it.

On the other hand, you may have some very sophisticated requirements and you may want to deal with a smaller, more entrepreneurial provider, so you explore them. Are the providers that you are dealing with professional and responsive and capable? Are they technocratic and demeaning? I don't understand why customers will stay with a provider that tells them they're stupid. And I've seen it. Internet discussion groups have actually seen access providers read the riot act, that's a nice way to put it, to their customers on-line. That's a great way to win friends and influence people!

The point is you're looking for a professional-quality provider.

Lastly, it is important to explore how many key people these access providers have. This last point is one that isn't often thought of. But as an example, if you have a leased line connection and you are experiencing routing anomalies and problems and their one engineer that understands it is out fishing in the middle of Lake Erie, you're in trouble. So how many key people do they have? If they have a technical support staff, how well backed up are they?

Again, all of these are hard questions that these providers need to be asked. And the more critical the Internet is to the conduct of your business, the more crucial the answers to these questions become. If you're just using it for dial-up, who cares? I mean, you can live with it. If you have your company's business riding on this, you have your secure parts databases that your sales force is accessing to try to be able to close a three-million-dollar sale and all of a sudden your network is partitioned and I can't get to it and there's no one that can help, you're in big trouble.

So again it is important to assess how critical these various functional capabilities are within each Internet access provider that you're exploring.

I mentioned earlier that I work as a consultant. One of the approaches that I am involved with a great deal with my clients is the development of requests for information. There are really three different types: request for proposal, which means here is a set of our requirements; we would like you to propose to us how you can meet those requirements.

The second is simply a request for information: We are not in a position to buy something today but we simply want to know how many locations do you cover. We have twenty locations throughout the world. What is your capability to do?

And the last is a request for quote. I need a T-1 delivered to me in Boston at area code 617, exchange 492, and I need it in three weeks. What is your price and can you do it?

Those are the three different kinds of formal procurement tools that are used. I think it is important to look at these, because a formal solicitation process forces you as the end user and buyer to sit down and think through the issues that I have been expressing to you this afternoon. What do we want? Why do we want it? What are we expecting that provider to offer? What are we looking for? What are the criteria that we are going to use to assess the responses?

You put all of that into a formal written document. You then announce to all of the prospective providers that might be of interest to you that you are going to announce this solicitation and get them to respond. You then have the ability, because they are required to respond in your format, to compare apples to apples and see the answers to those questions. If they don't, they are nonresponsive, I throw them out. That way you get a very clear comparison among them of what each can do.

I think it is important because a formal solicitation will force the providers to give you not only the best prices but the best suite of services to try to win your business. And if the provider won't respond to you in a formal fashion, then they aren't professional enough to carry business into the '90s and the next century to come.

Again, I believe in a formal solicitation process. It has worked very well. I have done this extensively for Web outsourcing. One of my favorite projects is the Discovery Channel. Discovery On-line, www.discovery.com, started out with this process. We met more than a year ago, went through the entire proposal evaluation/implementation process. It came up in July of this year. I believe it's one of the best sites on the Internet and it is because we spent the time to think it through, examine what we want and get vendors to respond in an organized fashion. I think this process works and ought to be considered if you are dealing with large requirements.

A couple bottom-line conclusions. I think the Internet is a wonderful business tool if you take the time to think about what it is you are trying to accomplish, what it is that you are expecting from an access provider. I absolutely believe that users must drive the technology, not the other way around. I'm sorry. Internet vendors can come out with all of the inter-whatever services they want. But if it doesn't meet a business need that I or my clients have, I'm not interested. I mean, maybe you'll get me interested because I like to play, but it is not something businesses are looking for.

It should be the other way around. You as businesses should be telling these vendors, what do you want to see, how do you want to see it delivered, what quality of service do you require, and at what price. You are in control. All of those providers that I showed you earlier mean one very important thing to you as end users. It is a buyer's market. You have the ability to drive the marketplace. I strongly encourage you to take advantage of that.

That's it for my presentation. I will answer any questions that you have on what I have prepared and spoken about. And again, for those of you who came in late, again I want to mention that we are going to take a break in a few moments or so and come back at 2:45. There will be a panel of Internet access providers. Each of them will have about ten minutes to present their views on what they believe you ought to be looking for. Then following that we will have our debate where each of the providers will be thrown questions, and we encourage you as the audience to participate.

So if there are any other questions, I'll answer them. Yes, sir?

M: I thought it interesting you didn't have in your requirements anything about security or firewalls.

Joel Maloff: That's a good point. The comment is I didn't have any comments about security. And actually that's an oversight on my part. I do believe that, especially for dedicated access, security is important. But that starts again with a security plan. Each company has to consider what they are protecting, who they are protecting it from, and then how much they're willing to spend on security. You then have the ability to start within your own environment looking at various pass code administration policies, looking at firewalls, application layer gateways, physical authentication devices. Again, that's a whole topic in itself.

I do look for access providers to offer some of that. But quite often I look for outside providers as well. What is important again is for you as businesses to be able to understand what you need.

Other questions?

M: Is ANS here? Are they in trouble?

Joel Maloff: ANS is not here, no. The question is, ANS is not here. Are they having any troubles? Well, the answer to that is America Online is here; they own ANS. The ANS backbone is in fact the underlying backbone in AOL Net today. As to the question of are they still focusing on offering direct end-user connectivity, it does not appear so.

M: [Inaudible]

Joel Maloff: We might want to talk about ANS off-line. Any other questions that I can answer for you? Yes, sir?

M: You mentioned congestion at the meet points. I was wondering if you could go into a little bit more detail about who actually operates those and where the points of demarcation between the different providers are.

Joel Maloff: The question is: Of the meet points that I mentioned, especially concerning congestion, who operates the meet points and how are the connections occurring in those.

Each of them is very different and they tend to be almost ad hoc. The network access points, for example, were funded by the National Science Foundation. There are four of those, operated by Pacific Tel., NYNEX, Sprint, and Metropolitan Fiber Systems. Those are the four. They are located in California, Chicago, Washington and New Jersey. And essentially in those cases you have to bring a T-3 or 45-megabit pipe to that site and then you have to arrange with the other providers that are connected to do what is called BGP or border gateway protocol peering to exchange your routes. So all that really is a site managed by a contract to the National Science Foundation to permit the research and education networks to have access to other providers. Not that many access providers either want to go into T-3 or have done so yet. Some of them have, but not all of them.

In addition, the Commercial Internet Exchange is a trade association that essentially consists of a router or series of routers using FDDI ring that multiple providers are connected to. It is important to recognize, let's say I am a small reseller and I am connected through Sprint. Sprint then interfaces at the Commercial Internet Exchange with many other providers. They do not have to accept my routes because I as the small provider am not a member of the CIX. Now, I can pay the \$7,500 and be a member of the CIX and then they will accept my routes. I have not bought a leased line from Michigan to Santa Clara, I'm still using Sprint, but now they have agreed to accept me.

The meet point issues tend to be individual. Each of the providers negotiates with other providers to accept their routes. It's not the way I would necessarily build the network if I were doing it from the ground up, but it does work and it has been effective thus far. I hope that answers the question.

Other questions?

All right, we're going to take a break now and come back in about fifteen minutes for our panel. Please come back. I think you'll enjoy the rest of this session. Thank you very much.
(Applause)

ACCESS PROVIDERS
INTERNET ACCESS PROVIDER'S PANEL:
WHAT DISTINGUISHES THEM FROM EACH OTHER?



MODERATOR
Catherine Smith
President, UUNorth International, Inc.

PANEL
Joel Maloff
President, The Maloff Company
Mark Fisher
Marketing Director, Pacific Bell Internet Services
John Curran
Chief Technical Officer, BBN Planet
Alan B. Taffel
Vice President of Marketing, UUNet Technologies
Rael Kuperholz
Planet Internet (Melbourne, Australia)

Joel Maloff: Good afternoon, and welcome back to our Internet access provider session. My name is Joel Maloff. The second part of our session is going to be hosted by Catherine Smith, who is from UUNorth International, the Canadian Internet access provider. Catherine is going to be hosting a panel of several international Internet access providers. Each of the providers will have an opportunity to speak with you and then at the conclusion of her session, we will again have a short break and come back.

The same panel of providers will remain and I will act as moderator, taking questions from you or posing questions directly to the panel. Each of the panelists will have one minute to answer, and heckling will be encouraged from you and the other providers. We will give you the chance to hold their feet to the fire. So we hope that this is going to be an entertaining and informative portion of our session.

So without any further ado, let me introduce Catherine Smith, president of UUNorth International.

Catherine Smith: Thank you, Joel. Good afternoon, ladies and gentlemen. This is where you have probably the most fun of your entire time at Internet World. So do I!

I am an Internet solutions provider. I'm a little bit different than your Internet access provider. I am a little bit different than your ISP just for services. I started UUNorth about five years ago when in Canada nobody knew about FTP, TCP/IP. Canada is still very much virgin territory. At least now that we still have a Canada left! Which is nice to know.

In the United States people were very busy selling TCP/IP and they were very knowledgeable about it. Canada is about two years further behind and we're 10 percent more expensive for access costs. As an Internet access provider I was one of the ones who was standing around saying, well, wire is fine, but how can you use it for business? What do you as a user want to use the Internet for? I was intrigued by how it worked, why it worked. But how could this work for you?

We at UUNorth are an organization of, actually, five of us under what we call Canadian Internet Alliance. These are organizations who are committed, with preferences and specialties and expertises in the various fields. We are not one organization trying to peddle routers, wire

and services to one person. We are a group of people with specific expertises providing coordinated solutions to you as an individual.

Should you only need Web services, we can do that for you. We do business applications. We start you off from a beginning dial-up account straight up to T-1 services. We help you each step of the way. If you need, we can come in, set up your computer. If you are an individual and you don't want training but do need some help and expertise, we will have you come to my home where I work and say, "All right, sit down, show me where you are having problems. What don't you understand?" So that I can better service all of my customers.

Understanding how the Internet is going to be used is crucial in the way that I can conduct business. We do all sorts of testing with people and it is not uncommon for me in my newsletter to say "Call me up, we have some software that we would like you to test. Let us know if this works for you. If it doesn't, why doesn't it? What do you see then that could work for you? What are the good points? What are the bad points? Do you like the documentation? Is it something that will be useful?"

This is what UUNorth's philosophy is and has been for the past five years. I am not interested in talking alphabet soup to people. Most of the people that I hire all have business degrees and commerce degrees and have been in business for over ten, fifteen years, who are all committed with networking interests in helping people communicate.

And that's the key to what the Internet is, especially with business. It is helping people communicate. It's not a fad, it's not a whiz-bang, gee golly, cool idea. It's something that will be here for a long time, that will become invisible. And all of this will go away. It has to, in order to help you work effectively. The media is going to have to calm down, be quiet and look at how people are successfully doing business and growing.

The people on the panel that I have are respected in their fields. They have been in this business, they have gone through trials, tribulations. There was a gentleman up here talking about how much money it was going to cost if you wanted to be an Internet service provider. These people have been spending this much and a lot more developing their businesses, developing communication skills, to help you as the end user better communicate.

I am going to call them up and they're going to have ten minutes. Now, ten minutes isn't very much, so they'll have to talk quickly. They will have to speak succinctly; they will have to get their points across to you. You, on the other hand, as an end user and critic, if you like, in this respect, will have to listen carefully and make sure that you got all the points so that when you come back in the third session to ask them questions, you'll nab them and you can make them feel as uncomfortable as you like. Unfortunately, that applies to me too!

I would like to call up as our first speaker Mark Fisher. He is director of marketing for Pacific Bell. He is the telephone representative on our panel. I would welcome him and I will leave you to your presentation, Mark. Thank you very much.

Mark Fisher: Thank you.

Good afternoon. Again, I'm Mark Fisher, here with the Pacific Bell Internet Services. And as a quick ten-minute discussion about what we think is important in terms of choosing an Internet service provider, I want to touch briefly on our vision for the Internet market as it relates to California and how we want to add value in that market and some of the things that we think are important toward providing good Internet services in California.

Very simply, the Internet has of course grown in such a way that the interest from both consumers and small-business market as well as high-end business has led to a point where many are interested in a very simple, very affordable, convenient solution to get them connected to the Internet. For those of you who have spent time in any of the sessions here, it is on the one hand a very complex task. But on the other it is something that I believe for the

sake of the growth of the Internet going forward, we need to provide a very simple solution, one that doesn't take a great deal from the customer's perspective in terms of resources and one that is affordable so that they can start in a small and reasonable way using the Internet as an effective business tool, and that we are there for them to grow as their needs change and grow over time.

I just want to talk briefly about the role we see Pacific Bell playing in the Internet. We have of course a long-standing tradition of providing data communication services throughout California. We operate the largest frame relay network and SMDS network in the state of California. Really, the Internet is a very logical and at the same time a strategic extension of a portfolio of services that we offer to businesses, folks at home and at work throughout California. Again, leveraging on the networks that we operate today, adding the functionality of Internet name and address routing and basic Internet software packages through our technology partners, the solution becomes complete. We offer a convenient, one-stop solution.

California, as you know, is a hotbed for Internet activity. By many estimates, approximately 30 to 40 percent of all Internet traffic either originates in or terminates in California. That notwithstanding, there is a huge market available in the state of California: small businesses, consumers who are looking for a very simple cost-effective solution that will grow this market substantially.

This is sort of indicative of the role we see ourselves playing. Admittedly, it is a single datapoint, but it is very consistent with the kind of research that we have done about what our customers are telling us they need. We have talked to many customers who now believe their Internet connection is as vital to their business as any other telecommunication service they get from us.

By and large, those are customers who are coming to us saying, We want you to offer this service. We'd like to think of this as just one more service in a portfolio of communication services that are being offered. We want to come to you to make it this a single, one-stop shop, a very convenient solution, a very affordable solution. And we view you as the kind of provider who can provide that on scale, in a reliable and responsive way to customers throughout the state.

I want to really focus on this simple slide but talk to it a little bit in terms of the elements that we see customers talking to us about, their needs, and how we can support those toward an Internet connection.

I have mentioned convenience and simplicity a couple of times already. We are absolutely convinced that what is needed in the market today is a very simple, very straightforward solution to easily connect the small business. If they want to start with simply an e-mail account and use the Internet in that fashion, they need something that is very simple to get them on-line.

Up until very recently customers in most cases, in many cases, looking for an Internet connection, would find they would go to many different places to get that solution and really were forced to build it on their own. They went and found the right hardware, perhaps the right software. They went to an Internet service provider, and they may have come to us for an Internet connection.

We really want to consolidate that into a single stop where we bring the access, the transport service, the Internet hardware and software through our technology partners into one place so a customer can come simply to us and let us handle that solution, and make an extension again of the portfolio of telecommunication services we already offer.

I mentioned cost-effectiveness. We feel it's very important and the feedback we have gotten from customers, of course, is that they want an affordable solution. And again the idea that this scales as a small business or a larger business first starts using the Internet for

something as simple as e-mail; their applications then grow and change. They begin using it for Web services. They may or may not need hosting services, and over time they may grow into an ISDN-based or dedicated-services connection to the net. We want to be there serving them and letting that service grow with their needs and with the applications they are using on the Internet.

Also, a comprehensive solution. I mentioned already these four elements that we think are essential as the building blocks to a complete Internet solution. We want to be able to do that in a comprehensive way. I will mention again as I talk briefly about our technology partners, we think we have brought that together in one place and made it convenient for customers.

Finally, a single point of contact. And I'll bridge this with the next idea, which is a California focus. I've already mentioned that California is a hotbed for Internet activity. We absolutely believe that our commitment to the California market, that our existing account teams who are out there serving customers with their voice and data-service needs can extend that service to include Internet, and they are in a position to leverage again the relationship that exists with these customers and add to that a valuable service in Internet connections. They are in a great position to explain the dollars and cents, the sort of mini-business case of connecting the customer to the Internet that helps a small business decide this makes sense for them.

This is the kind of discussion, this is the kind of relationship we have had with customers, business customers, throughout the state for some time. And it makes perfect sense then to add Internet to this portfolio.

Also, a reliable, responsive service and support center. We see a very strong need for a California-focused, California-based service and support team so that customers at home or at work when they have a problem, when they have an issue, they can call us seven days a week, twenty-four hours a day, there's someone there who understands the problem and is committed to working this out. This is, again, an aspect of the business of communications that we have been about for quite some time. Bringing the right level of customer service and support to this solution is something we are absolutely committed to do.

I mentioned some technology partners. Of course, at the same time understanding our strengths, the basic business of communication services, we recognize there are places where we need technology partners to help us create the right solution. Cisco Systems has been a long-standing partner of ours for access routers at the high end for business. Also, Sun Microsystems with the Netra server line providing a complete Internet-based server for the business location. And in the software area, Netscape Communications, a partner of ours both in the server area for products we're using in our Internet but also, more importantly, creating a customized dial-up package for the consumer, for the small business, whether it be via analog modem-based dial-up service or whether it be the ISDN. We see this again, the Netscape partnership, as essential to making this easy, convenient, and affordable for customers.

And finally, addressing the issue of security, our partnership with Sun Microsystems using the Firewall I security product will help business customers establish a secure presence on the Internet.

Very briefly just in terms of target segments, this isn't terribly sophisticated in terms of analysis, but it makes an important point. One is, we are committed to the marketplace in California. Consumers, people at home, people at work who we think will need the Internet, will want the Internet services, a convenient, affordable solution in both places, we want to provide that solution. And then as well to the point of being able to grow along with the small business's needs, we want to be there. We are certainly in this for the long run.

As the small business begins to use a simple e-mail account and evolves into much more sophisticated Internet-based services, we want to be there to grow with that customer. First, to

bring them on, help them understand the power of the Internet, and as time unfolds, to be there as their business grows.

There's a brief discussion of our services; this slide touches on the dedicated services. And I have a handout that is a little more extensive than the slides I've just gone through. I will leave that there on the podium. As you leave, you can pick up a copy.

I certainly thank you all for the time to talk about our vision for the Internet. Again, making this convenient, affordable. Our commitment to the California marketplace is, we think, an essential part of the solution for the customers we serve. Thank you. (Applause)

Catherine Smith: He did very well, didn't he? Right on time. Thank you very much, Mark.

I now am going to introduce John Curran. He is chief technical officer of BBN Planet. John, if I could ask you to come up, please. Thank you very much.

John Curran: Good afternoon, I'm John Curran. I'm the chief technical officer for BBN Planet.

Some of you might have heard of BBN. BBN is Bolt, Beranek & Newman. We have been involved in the Internet for now a little over twenty-five years. We built the first Internet. We are located in Cambridge, Mass. I am happy to come over here for the afternoon.

I hope you will bear with me, because I'm going to be speaking a little fast. Ten minutes is not a lot of time, so I hope you bear with the accent and the speed at which I talk. It's customary in the area.

I am not going to talk about BBN much. Many of you are BBN customers or, if you have walked the show floors, you have seen them. What I am going to talk about is selecting and evaluating Internet providers, some of the things we feel are prime differentiators, things you should be paying attention to.

So without further ado, as Joel mentioned earlier today, the Internet services marketplace breaks into a number of segments. Dial-up, SLIP/PPP services, dedicated Internet services, Internet security solutions and Web information hosting are sort of the prime segments of this marketplace. There are different criteria for every segment. You've got to figure out what you're buying first; then you can decide what criteria apply.

I am going to go through each one very quickly and talk about some of the characteristics you want to ask. In the dial-up marketplace, many people offer dial-up access. You can get dial-up access locally through a local dial-up provider; you can buy nationwide services. They vary by speed. They vary by price. Some of your dial-up services are very cost-effective. Because they are local, there's only a local toll charge or, if you have the right billing plan, potentially no charge.

Some of the services are not necessarily as cost-effective. You have 800 numbers in use; we have 900 numbers in use. Many people are paying more for their telecommunications charge to dial into their provider than they're paying the provider. You pay \$19 a month for Internet service and then you pay a local toll charge of \$40 a month worth of usage. You have to pay attention. Some of these services are flat rate and they are flat rate up to a count, ten hours, twenty hours, twenty-five hours, thirty hours, and then they bill you each hour beyond.

When you go to decide what you want for Internet services, one of the questions you have to ask yourself is: What do I think my usage is going to be? How much Internet service do I need? In the dial-up marketplace the thing that gates that is how much time you spend directly on-line pulling down information.

There's an addressing issue. One of the concerns that happens is that if you want to have a reliable Internet address, the same Internet address each and every time you dial in, you have to ask your provider. And this is an important issue. It turns out we now have many customers who have their sales force out on the road or they have people who are traveling

out on the road and they want to dial in and they want to have a predictable Internet address associated with the user. That is a very difficult thing to deliver. But it allows you to open up your network and permit communications with that one customer.

Most of the time when you dial into the Internet you're anonymous, meaning you're just as if someone next door dialed into the Internet. For this reason, if you are expecting something else, if you are expecting to have a predictable Internet address, you have to ask. If you want a domain name, one of the most interesting things we're seeing now is companies who come on-line and say, "Well, I thought if I got connected to the Internet I'd get food.com." No. You have to ask. If you want a name for your company, it's called domain name service and it is an essential part of being a business on the Internet. Don't buy a dial-up service that doesn't give you your own name.

News services and mail services are also required. Things you have to ask your provider.

Now, we don't actually provide a lot of dial-up services. BBN Planet provides dial-up services to its corporate customers to meet their needs, but we don't sell certainly on the individual marketplace. You can see dozens of providers who offer individual users access to the Internet. Our focus is on the commercial market and the organizational market, principally in the leased line area, the dedicated access to the Internet.

We now have over fifteen hundred organizations that are receiving BBN's services, and those can be delivered in a number of ways. You will hear this from many providers. You have to ask what you're looking for. There's leased line services, frame relay services, ISDN services. Which is actually a form of dial-up, but if you are a business, an ISDN service that connects very quickly can be in some ways indistinguishable. SMDS services, which is switched multi-bit data service, which is a very-high-speed service. And we are seeing the emergence of some ATM-based IP services now. Depending on what speed you want, you want to ask your provider, Okay, I'm interested in T-1 speed. What's my choice for a T-1 leased line? Now, if you offer SMDS, what's my choice for T-1 SMDS service? Now, if you offer frame relay, what's my choice for T-1 frame relay?

Those will be different services. And they are going to have a different underlying rate, so it is important to ask. You can't compare two services that are slightly different. The performance may be similar, but the prices are going to be different depending on how you connect.

One of the most important things to find out is how the networks are engineered that you're connecting into. There is a term used in the industry called an over-subscription level or a fan-out level. Which is, if you have a bunch of connections into a point of presence, how much bandwidth is serving that point of presence?

Those are questions you should be asking. You should be asking, how much capacity is going into the POP that I am being served out of? What is the aggregate customer demand? Now, I know this may sound like something you don't really care about. And you don't. People value the Internet for connectivity first. So if you're just going to get connected, it may not matter. Now, when you actually go to use the Internet, when you actually try to move that image file to your business partner, when you actually try to get involved in a business solution on the network and the performance matters, this is where the differentiators come in.

A lot of people can connect you to the Internet. The question is going to be, at what performance. So you want to ask. You want to ask what their over-subscription level is. You want to ask what the backbone looks like. You want to ask where they interconnect.

For those people who were here in an earlier session with Joel, he mentioned the interconnect points, the NAPs, for example. You should know where your provider is connected because it does affect the bandwidth. One of the interesting things about the

Internet is that people talk about the available bandwidth as if it's just like a circuit. I buy a T-1 circuit from here to Cambridge; it's a point-to-point circuit. In the Internet we don't have two points; we only have one. We have you and we have the entire Internet. Your performance between you and another site in Cambridge, you and another site in Washington, you and a site in San Jose, and finally you and a site going international are going to be different.

You can't buy bandwidth that is committed to the entire world. Actually, you probably could, but you wouldn't want to pay for it. Okay? The reality is that the Internet relies on an over-subscription level to allow you to reach a host in Beijing without paying in advance to have that capacity.

I am going to try to move very quickly and talk about some last aspects of dedicated services and hosting services.

Routing and addressing. Has anyone heard about Internet addresses? We have an issue. The Internet needs addresses in order to connect you up, and there is a finite number of them, so you want to ask some questions when you come on-line. They may seem minor. We've seen companies get snarled in them two years later. Which is: Do I own my Internet address? When I change providers, does my address come with me or am I going to renumber my local area network of a hundred hosts? It's worth asking.

Equipment. Does the provider provide the equipment? Should you provide the equipment? There are major differences in prices, and so you have to make sure you're not comparing a quote without equipment to a quote with equipment. Important issues.

Packaging with other services and, finally, redundancy. We have a number of high-performance customers who are now asking for redundant capacity, well-engineered links, so that they can offer their Web sites high capacity or they can have a high-availability solution. We build those routinely. BBN in addition to selling Internet services to a large number of organizations does a lot of responses of exactly the type Joel mentioned earlier, the RFP-style response where someone is seeking a custom solution.

So you want to ask. If you think you have a high-availability requirement, it's something worth asking. It may not be commonly dictated, but a good provider knows how to build that.

Now, dedicated Internet access is not the entire market. In addition to worrying about the bandwidth levels, you have to worry about what your pricing is. We have a shakeout occurring in the industry today. As your bandwidth goes higher and higher, it is more difficult to predict reliable performance with fixed pricing. The legacy of the Internet is fixed pricing. Five years ago it was all a flat-rate annual, no matter how much you used. You will now see the emergence of providers at higher bandwidths who want to charge you based on your actual usage. And so that's a hard thing to decide.

You want to make sure you're paying a fair rate, you're getting usage reports that say how much you're actually using. Depending on what you think your usage is, you can end up with a wildly different price. And so it is something you have to watch out for. On the other hand, the good news about a variable price is that we know as you make more use of the network, there's more engineering concerns. So there is both a good — There is a cutting edge in both directions.

Now, different providers take different approaches to where the service demarc is, where they accept responsibility for. BBN historically accepts responsibility to the customer's LAN. The network, the connection, the local circuit, the CSUs, the router are all ours for operational purposes. We configure it, we manage it, we monitor it. At 2:00 in the morning if something goes wrong you shouldn't be calling your provider; your provider should be calling you to say something's wrong and we're working on it. If you have someone who is proactively managing your Internet connection, you can put your services on it and not worry about how it's being watched.

Now, we also provide the configuration management. We operate the whole thing. We provide problem tracking, and we are responsible for on-site field service.

I would like to quickly skim through Web hosting and security services just to give you an idea of the issues involved.

Internet security comes in multiple flavors. When you get connected to the Internet you have to go looking. Think about different layers. Packet filtering. You can secure the network just by blocking certain packets if you know where all the hosts are. Application-level filters? This is something that sits between your network and the Internet and stops each transaction. A higher level of security. Ask what you're buying. And then finally for those people who are going to have a Web site you want to ask, if you're connecting to the Web, where's my Web server? What's the performance level? And the same questions you ask for dedicated access: engineering level, monitoring, response, ticketing, et cetera.

I would like to thank you for having me here, and I look forward to the questions.
(Applause)

Catherine Smith: Thank you very much.

I would like to ask Alan Taffel, who is marketing director for UUNet, to come up.

Now, we ask for your indulgence on this. We're going from Apple presentations now to a Netscape presentation, so we are going to give him a few minutes to set up.

I hope this is giving you some ideas of what all of our different service providers are offering. I hope it puts some questions in your mind for the next session so that you can pin these people down and get exactly what you want out of them. We have presented this for you. We have presented this to stir your thoughts, give you a better idea of how you are going to choose a service provider and what you should expect the answers to be so when you call your service provider tomorrow and ply him with all these questions, you will know and expect what his answers should be. And ask him if he can tell you precisely in ten minutes or less exactly what services he can provide you with.

Are you ready? Alan Taffel, ladies and gentlemen.

Alan B. Taffel: Thank you very much, ladies and gentlemen. As you can see, this presentation is a little bit different. Rather than being PowerPoint, it's actually an HTML presentation.

I was very glad to hear John Curran's presentation because he told you about the criteria you should be looking for when selecting an Internet provider, and I agree with everything that John said. Now I would like to assure you that there is in fact a provider that actually meets all those criteria. And that's obviously UUNet Technologies.

A little bit of background about us. We were actually the first commercial Internet service provider. In 1987 our founder, Rick Adams, had the idea that, gee, this technology which has been used in the government and for primarily research purposes would be a boon to businesses, and so he founded UUNet Technologies at that time. Today we are the largest Internet service provider to businesses. And we are one hundred percent focused on the business sector of the market. We don't spend a penny trying to woo consumers to our service.

We are also somewhat famous for being the builders of the infrastructure for the Microsoft network. If you are using the Microsoft network and you're using the Internet to get to the Microsoft network, you're actually going over UUNet Technologies.

Now, I mentioned that we have a focus on business. And what that means is we have to have the highest quality of service and we have to have value-added services that are tailored for business users. Let me tell you about some of that.

This will give you an idea of some of our representative customers. And sometimes people are surprised to find out that a lot of these on-line service providers are actually customers of UUNet and use our infrastructure, such as America Online, CompuServe; we already mentioned Microsoft. A lot of telecommunications companies fit into the same boat and we have many financial customers and many customers in all other areas. This is a very small subset of our customer base. We actually have well over eight thousand corporate customers. Not eight thousand individuals or anything like that, but eight thousand corporate customers.

Our network meets all the criteria that John described to you, but let me prove it to you. We have a nationwide — we're not just in one region — we have a nationwide backbone. It is a dedicated 45-megabit backbone. It's our own backbone. And I am going to show you a picture of that in just a moment. All of the links in that backbone are fully redundant. All of the switches in that backbone are fully redundant. All of the switches, all of the hubs are located in telco facilities with uninterruptible power supply. So we really are very, very serious about making the investment so that our service is a business-quality service.

And we are equally serious on the dial side of the equation, because business users require business-class dial services as well. One of the worst things you can have in a dial network is busy signals. We have engineered our network, at additional cost, obviously, but we have engineered it so that the network delivers what's called in telephony terms a P03 grade of service. That means there's a less than a 3 percent probability of getting a busy signal any time you dial up.

And there are hundreds of points of presence in the U.S. By the end of this year we will have 230 points of presence in the U.S. and another twenty cities internationally. All of our dial points of presence support all speeds all the way up to ISDN, not just stopping at 14.4 or 28.8. And all of our high-speed points of presence, even if they are not directly on the backbone, connect to the backbone at very high speeds like 10 megabits. We don't have any 56K connections from any cities into the backbone, as do many other service providers, so you don't have those local bottlenecks. Of course, we have 24-by-7 network operations and proactive monitoring.

Now, if this works right, I can click on that hyper-link and get a view of our backbone here. Sorry that's a little bit fuzzy on this video system.

One of the things I would like to point out to you is that we do have the most connections to other components of the Internet of any Internet provider in the world. We have more connections to other domestic points and more to other international points than any other provider.

Now, as a business you need a full range of options to get onto the net and then you need value-added services, so I will spend just a little bit of time on each one of those.

As far as dial-up options, as I mentioned, every port supports 14.4, 28.8, ISDN, and we have all kinds of usage billing schemes. For instance, at the show here we just announced a new scheme called Internet 9 To 5, which gives you completely unlimited access, unlimited number of users from a LAN to the Internet for a flat monthly fee during business hours, 9:00 to 5:00 Monday through Friday, \$130 a month, flat rate.

And then we have all the selections you could possibly want in terms of leased line and quite a few that are unique. For instance, our burstable T-1 service, which is actually our most popular service, allows you to have the full access of a T-1 pipe but only pay for what you're actually using, a concept that we borrowed from the frame relay world with the CIR. So it is much less expensive than other providers' T-1 services and yet you can use the full capacity of the T-1 when you need it. Very attractive option.

We also have a tiered T-3 service which is for people who need more than T-1 but don't need a full T-3. We can sell you access at 3 megabits, 6, 9, et cetera, all the way up to a full T-3.

In addition, we have I think every value-added service you could possibly need. At least we're trying. First of all, we will do turnkey Web hosting and content services. We have a Web server farm at our headquarters in Fairfax. It is co-located with a major Internet switching hub, which means that we can provide you, your Web site, with 90-megabit access to the Internet. Think what it would cost you to buy 90 megabits of capacity to the Internet. Of course, we're not going to charge you for that; we only charge for what you actually use, which is probably much, much smaller. And it turns out that our hosting services are about one-fifth the cost of doing it yourself. That's not 20 percent less; it's 20 percent of the cost of doing it yourself. And it is a completely turnkey solution. You don't have to buy any servers or anything else; we take care of everything for you. It is a lot less expensive and it is higher performance.

We also have a full range of security services starting with consulting, which we believe is very important. You should have a security policy that encompasses the Internet. Then we provide firewalls if you need to protect your internal resources, and we have encryption devices if you need to protect your data even as it is traversing the Internet. Finally, we have training oriented for either end users or for systems administrators.

That concludes my prepared remarks. I hope you've seen that we have gone to great lengths to provide a true business-class service for business users of the Internet with the most robust network available and the broadest spectrum of access options and value-added options. I think I ended on time. Thank you. (Applause)

Catherine Smith: We have left Rael Kuperholz of Planet Internet in Australia for our last speaker of the day. He has come an awful long way and we are very pleased to have him. Mr. Kuperholz will certainly let us know what life is like in Australia for an Internet service provider and I think he will certainly open our eyes. If you think that bandwidth is expensive here in the United States, it's expensive in Canada, but I think you will understand how expensive it is Down Under. Welcome!

Rael Kuperholz: Thanks very much, Catherine. Good afternoon, everybody, ladies and gentlemen.

I didn't have as much opportunity as the others to prepare a slide show. Neither did I have a laptop, having dropped it at San Francisco Airport on the way over, and so I thought I'll use a little bit of innovation or borderline on cheap because I like your vote, get your support. Not that necessarily many of you would want to dial international to Melbourne to connect every time you wanted to chat on the Internet.

So bear with me. It is going to be pretty much of a loose-form discussion and chat.

As you can see up on Netscape, I'm off our server in Melbourne. That's Integration Design, a company that's been going for just over six years now, and the idea is people and technology providing integration services. About three years ago we started getting asked a lot about the Internet and doing a lot of work for organizations wanting to connect to the Internet. And you probably heard that expression if you lie down with dogs, you're going to get up with fleas. And what was happening was, we were advising and recommending customers or connecting them to different service providers, and found that all the problems associated with pretty poor services was rubbing off on the way the customers were treating us or thinking of us and we were being tagged with the same mark.

So just earlier this year we decided to set up a new company. And hopefully the bookmarks will all be there. What we did was we set up a company called Planet Internet. And

Planet Internet's strategy has been to capitalize on the weaknesses of all the competitors, because the big Internet providers have been going for somewhere between one and two years. And I think that everything we looked at and decided that we're going to try to overcome with Planet Internet or were issues to avoid are all very much particular.

Now, I said I'm going to cheat in order to get your vote. I've brought something really special over here. I've got something that's probably more unique than anything at this show. It's a Planet Internet T-shirt. I brought one because I travel light. It's one Planet Internet T-shirt and it's for whoever stands up during the panel discussion and asks either the best question or gives me the best reason why they should own it. But there's only one other one: Joel Maloff. He came to Melbourne to fetch his. I've got one and then you'll have one, so that's how I'm going to cheat for your vote if it gets down to something like the Quebec referendum.

Now, the key thing is demystification, trying to demystify everything. What we found is that organizations, whether it's an MIS manager or an individual wanting to connect to the Internet, there's a lot of mystery associated with the Internet. So whatever you do, you have to be able to demystify the whole concept, demystify the technology, and make it as painless as possible. We also, like Alan said, focus on the commercial side of the business. But what we have found is in order to avoid litigation, more and more companies are becoming very aware of the need to have e-mail usage policies, corporate conduct policies for the Internet specifically to avoid things like breach of copyright, intellectual property, libelous statements, and so forth. So we capitalized on that and created a special package so that our commercial customers can offer their staff personal dial-up accounts at a major discount or subsidize that to what they can get via another Internet provider. And this way you're encouraging staff to present themselves as individuals via their personal dial-up accounts from home or wherever and utilize corporate Internet services for corporate business.

What was also said earlier on, you've got to have partners, technology partners. And we recognize that there's no point us setting up an Internet provider service using equipment that our customers wouldn't use in-house, so we based everything on a Rolls-Royce platform. We actually brought Ascend Communications into Australia three years ago, so we're using Ascend, Sun, Netscape, Bay Network, Cisco, and so forth; Hayes modems, if we have any, and that type of thing. So it's all very important to base yourself on the equivalent platform to what you would expect your customers to be on.

A few other quick ones I put together. If the only time you hear from your Internet provider is when you get the bill, then it's probably time to change. And if you get any handwritten communications, it is also I think time to change. These are all things, sort of weaknesses that we experienced during the last few years.

We've had the situation in Australia — I don't know; I'm sure it's happened here as well — if you've had Internet providers who've been badly hacked and their credit card or the customer credit card or accounting or billing details have been published on the net, then it's time to change. If you experience any downtime that is going to affect your business, then it is also certainly time to change. And as Alan said, you've got to be running on a fully redundant platform, fully redundant circuits and connections into the net.

Also, if your help desk calls do not get answered by the next day, then I think it's time to change. Somehow or another people don't tolerate anything worse or longer than that when it comes to support for any other aspect of IT, but because of the rapid growth and the poor service associated with a lot of Internet providers, customers are becoming almost used to long delays in getting back or hearing back from their help desk. So it's something that you do have to do.

As I said, we also have dual-homed gateways. People in the United States are very spoiled with endless bandwidth. Companies talk T-1's at all times. Alan mentioned that they've

got nothing less than 56K. We don't have anything less than 56K either, but it's what you put down that one 56K requires more than just innovation. It requires perseverance and so forth. It's about just over two million dollars per annum if you wanted a T-1 from west coast California to Melbourne. So we can't afford to expend bandwidth like you can over here. And it has forced us to become very innovative.

What we do is, we provide separate circuits for traffic going out international versus traffic that's on the domestic backbone. We also run, as I said earlier, on high-speed Sun Sparcs. All the software that we use, whether it is Web service software or anything else, is all fully licensed software. So like you want and expect your provider to have a 1-800 number for you to call for support and help assistance, we also have a 1-800 number that we can call when something fails. And I think that that is extremely important, considering that so much of the Internet is based on freeware and shareware software.

We use the Firewall I for customers' Web sites, co-located hosts and so forth, in order to provide the best level of security as possible. We also decided to provide not just co-located Web servers but something you want to consider commercially is, we looked at and have satisfactorily achieved co-located firewalls as well as Web servers.

So if you've got an organization that really doesn't want to fuss with it or develop any in-house expertise, they recognize that it's easier to place their firewall and their Web servers, and maybe they run a news server in-house, rather than in-house, outsource it to us and run it in a proper computer room and facility and environment with backup and a higher-speed connection to the Internet, particularly if their Web server is supporting the customer's worldwide base.

So we think that that's been something successful, well-received, and it's quite innovative. We do things like DNS registration both out of the United States as well as the dot AU for the Australian market or dot NZ for New Zealand.

The other thing is, all Web work and all Web hosting we do for customers is in fact not us licensing the intellectual property to the customer but we do it on behalf of the customer and ownership resides with the customer. So that if someone is unhappy with our service or for one reason or another want to take an outsourced solution back in-house, it is a case of asking for the disk drive or asking for the source code or HTML code or whatever it is that we've done for them.

We also provide comprehensive software suites I mentioned for all the staff of the commercial customers, et cetera. We put a range of PlanetPacks together that's got fully licensed software available for them to be able to connect. They don't have to know how to start downloading and so forth. At a senior executive level we are finding that it is still very hard for people to use PCs, let alone connect the modem up, get to the Internet, and then have to download the suite of software that they need to use to gain access. So we have written installation programs and a customized menu front end for them.

We also use interactive voice response for our help desk and fax back, and we have based our help desk — It's very important what a service provider is running his help desk on. We use a product from Remedy Corporation called *Action/Request System* that, from my understanding, most of the large Internet providers worldwide would use it. It's a superb product. It does things like autoescalation, automatically pages people if the autoescalation is still not gaining response. We interface the network management system directly into the help desk. And we also have a front end from Remedy called *AR Web* that in fact allows our help desk that's sitting over in InformLINK's database to be accessible only to our customers at or from home.

Say if they've got a problem that's not affecting their connectivity, they can actually access the help desk direct; they can see what the flow of the issue is, how it's tracking through

our organization, how it's been rectified, and all the results of that information goes into a knowledge database with a free-form text search facility so they can come in and see maybe someone else had this same problem and it's been resolved. And that way it cuts down on their voice traffic coming in to us and in to our help desk.

As I think John mentioned this morning, he went to the Ameritech Web site to see if he could get ISDN access to his house. I thought that was pretty neat. And I suppose it's the same concept in a much smaller way we're trying to achieve.

We use uninterruptible power supplies, backup power generators, 24-hour backup air-conditioning; as I say, dual ISDN feeds. Everything we use in Australia is ISDN-based with frame relay leased lines and PST and access all available via ISDN, so it keeps it much simpler on our end and gives us an affordable as well as an adequately reliable service.

One of the other things that we have done is, we have created a little bit of a chat show. We have tried to encourage our customer base, be they commercial or the staff of our common commercial customers, to talk to each other; and we try and create a really friendly environment. And we've found that that also cut down on a lot of calls coming into our own help desk but at the same time the customers got a much quicker answer. And so we encourage people to — We've got like the equivalent of a closed news group and we encourage people to post some of the queries that they might have of a very wide and general nature, not specifically specific to the Internet or problem proper. And this way everybody who's connected to Planet Internet is in fact sharing the ideas.

Just two other, couple of things. Catherine mentioned in her opening remarks that she's an Internet services provider providing services. Alan also mentioned the fact that he is providing consultancy services. We have found that the strongest part of the Planet Internet business has been the fact that it is a spin-off from Integration Design. So you've got an organization that is very accustomed to dealing with multi- billion-dollar or five-million or three-million- dollar organizations in providing services.

Just two last things and then I'll get off and we can start the panel. I noticed just setting this up today that we are an extremely innovative but a very truly international company, and I was actually very impressed to see that one of the people in our office in Melbourne actually knew that it's Halloween and they've got an "Internet Celebrates Pumpkin Day" booth at the bottom right-hand corner of our innovations page, so you can't accuse us of not being international.

Lastly, I thought probably the other most important reason why people select Planet Internet is that we are renowned for giving the best Christmas parties. And because it's summer for us, last year we did a beach party that degraded into something wet and nasty, but I'm not sure what's planned for us for this year. Thanks very much. (Applause)

Catherine Smith: Not only does he travel far and fast but he also cheats! He didn't tell me he had a T-shirt with him!

As you can see, Joel Maloff is going to be our stagehand. I think if I can get the rest of the gentlemen up here too, maybe they can give him a hand.

We're not going to take a break. We are going to just move the table so that you can get a better shot at all of us and we can go on from there with your questions, and hopefully we'll have all of the answers you're looking for.

Now that I have told you all about their companies, I can tell you a bit about UUNorth as they are setting up. UUNorth does do a 7-by-24 service, we do do dial-up, we do do dedicated services. We do them for individuals as well as for corporations. And while he does Christmas parties in Australia, we do barbecues. And we have barbecues at least five to six times a year, and we've had tremendous turnouts. We find that communications is the most

important thing, and I think that you've gotten all that feedback. Keep asking us questions. Tell us what it is that you're looking for. Because we can't help you unless we know where you're at. So now we look forward to communicating with you further. I'll leave it to Joel.

Joel Maloff: Thank you very much, Catherine. We've got a chair for you. There's another mike over there so you won't need that one.

This is the part of the session that becomes interactive and you are welcome to participate in this. The idea behind this is that for the first time you have the opportunity to have multiple Internet access providers and ask them the questions that you want to know and be able to ask them to answer it. And so I have a series of prepared questions that I am going to start with, but you as the audience are welcome to participate. If you don't like something that somebody has to say, you are welcome to throw out a comment or heckle or other questions. Each of the panelists is also welcome to comment on the other panelists' statements. So again we hope this will be fun and enjoyable but also informative to you.

So let's start with the first question. My first question to all of the panelists, and I will throw this to Mark to begin with since you are down at the end, each of you will have a minute to respond to the question. And, again, you're welcome to respond to each other.

I would like to understand from your Internet service provider, can you define what 24-hour by seven-day-a-week coverage means to you and to your customers?

Mark Fisher: A very good question. 24 by 7 of course in our minds is having an individual available, knowledgeable, capable, to answer a direct call or a live e-mail into our center about problems they have; again, whether this is an individual at home, a consumer, or at work in the business. And we have three tiers of technical support staff set aside; a very sophisticated — as is consistent with our core business — system by which we can track troubles, accept inbound calls, provide on-line help through the Web, through e-mail and through voice response units.

So it is again a very comprehensive solution so that anyone at any time of any day can call us with a problem, we'll help them fix it; with an objective of 90 percent of all problems being handled and resolved by the first person that the customer talks with.

Joel Maloff: Now let me ask the rest of the panel. Do you think the kind of coverage that Mark has described is adequate? (Pause) All of you think it's adequate? Does anyone want to comment? John?

John Curran: Oh, sure. I would like to say that some organizations require a different level of 7 by 24. BBN actually — For those people who don't know the history of BBN, we acquired multiple networks, the networks that were involved in some of the earliest network operations. One of the advantages of that is that we have multiple network operation centers. We run two 7-by-24 network operation centers. We actually operate the network of a number of Internet providers who have outsourced their network management and monitoring to us out of our network operation centers.

And so what we look for is, we look for not only the fact that we have depth of staff, full coverage monitoring the network in multiple locations, but also that the talent that is available and the resources that are available at 2:00 o'clock in the morning for handling our customers' e-mail requests, for handling routine changes, for handling a hard outage, a customer that needs field service dispatch, are just as good at 2:00 a.m. as they are at 10:00 a.m. on a Monday morning. So we run 24-by-7 and that basically means you stop distinguishing between day and night.

Joel Maloff: Alan, do you have a comment as a nationwide provider?

Alan B. Taffel: Yeah, actually I basically thought that Mark had a good answer.

One other point I would make is that while you have different levels of engineers in the organization, it is important that a senior engineer be on hand, on-site, I should say, not at the end of a pager but on-site twenty-four by seven as part of 24-by-7 support. Another point is that the actual network operation center itself needs to be up twenty-four by seven. I know I won't get any disagreement about this point. So it is important that the network operations center itself be on an uninterruptible power supply, ideally backed up with a diesel generator itself, and have plenty of capacity into and out of that NOC.

Joel Maloff: Okay. Now I'll throw it to Catherine and Rael. You both have smaller companies than the other three represented. How do you address the issue of 24-by-7 coverage?

Catherine Smith: We have people on-staff seven days a week twenty-four hours a day. When you pick up the phone and call for help, there's going to be a live body who answers the phone saying "This is UUNorth International. May I help you, please? What is your problem?"

You may have problems and we can help you with your network, but just think if I phoned someone like UUNet Technologies and I say "I believe we may have a problem, could you check your circuit for me?" and I can't get a hold of him. That is not going to be helpful for me trying to get you the best service possible. So we like to work with organizations that do have 24-by-7 support which has actual people, because there's nothing worse than getting a groggy techie who's just piled out of his bed to answer the damn beeper that was across the floor. That's not acceptable. He can't think on his feet and he can't understand what it is you're about. So seven by twenty-four for us insists that we do have an adequate staff all the time.

Rael Kuperholz: Joel, we had to address this and obviously try to make it affordable. And as a startup venture, as a small Internet provider, you don't have the resources of, say, a UUNet or a PacBell. But you can do pretty well. There's certain things that you can do straight-away that can prevent any disaster, things like that you should really be insisting on from me if you're dealing with a smaller Internet provider. And that is, you've got to have redundancy. You've got to have redundant connections if it is ISDN or however you're connecting to the Internet backbone as a provider. You've got to have uninterruptible power supplies and standby power and dual air-conditioning systems and so forth. Things that can certainly bring your network down and are very easily avoidable at a not too high a cost. So we certainly took that approach.

The other thing is using all SNMP- managed equipment, so all the equipment that we use has the ability to be remotely network-managed. And we have managed to interface it very successfully. We use the HP Open-View platform and we use that as part of our network management into our help desk for autoescalation. What that does is, it automatically contacts people if they're not on-site.

Now, we're very fortunate the way we have packaged everything up as far as staff goes in that we've got three of our most senior engineers who can handle the operating system and the hardware all within, if I said three or four minutes from the office, I mean that. But what we do is, we tend to man the office Monday through Saturday through till midnight. Which is the busiest period. Sunday is invariably a bit of a housekeeping day for us so we have people in the office. The biggest issue we have had to face is in fact customer support for the dial-up. And I can understand organizations who don't want to touch it with a barge pole.

We find that supporting the customer on the commercial side is relatively simple. And we also have a deal with the ISDN carriers that we use, and they do monitoring on the lines

and they contact us if there's a problem as soon as they detect it as well. We haven't yet had any downtime of any note, so we're feeling quite relaxed at the moment.

Joel Maloff: It sounds like we don't have much disagreement on 24 by 7. Mark, do you have any further comment?

Mark Fisher: One final comment. Good customer support is good people, good tools, good process. Those are the essential ingredients. I want to add as well that we see an important distinction between what is a 24-by-7 network operations center, which you have to have, and what is a 24-by-7 customer service center. They are two very different organizations. Though they work closely together, they have different objectives. Their success is measured in different ways. And it is an essential commitment to both that nets out as strong customer service.

Joel Maloff: All right. Before I ask another prepared question, are there any questions that you from the audience have? Yes, sir, in the back?

M: I guess my question is to Mr. Fisher but I'll take it from the other panelists as well. How do you see the cable TV industry competing with your business in the next five years?

Joel Maloff: Let me repeat it. The question is, how will the cable TV compete with the businesses that each of you represent over the next five years? And, Mark, he asked you to respond. Why don't you go first.

Mark Fisher: A very good question. The application of on-line services via cable TV connection to the home is an excellent one. One of the reasons why we are committed to building out a hybrid fiber/coax network, a cable TV network throughout the state of California for the customers we serve, in the long run that will take some time to build out. In the shorter run we are pursuing opportunities like wireless cable because we believe, among other things, that the on-line cable TV-based access to the Internet and other on-line and information services is a very good application. We think it is very appropriate to play there.

Joel Maloff: Let me throw it to the other end. Catherine, how will cable TV play in Canada and will your company be put out of business because of cable TV?

Catherine Smith: No, because basically it is not the technology of wire that we are addressing here. We are addressing the matter of services and how we can help you as businesses and individuals access the network.

Cable may be there, cable may be fast, but in Canada we are behind. We are only doing pilot testing now. From what I understand from Rogers as a statement of fact, that they do not believe that the Internet and your PC will actually meet. That you will have your PC and the Internet for business use; you will have the Internet and cable for TV. They do not see it as a combination. So I think we have a ways yet to go in Canada.

Joel Maloff: John, how do you — ? Or, Alan, are you next? Don't be gentlemen; go after it!

Rael Kuperholz: I just want to say something about that, just looking at it from the outside in. Australia is just busy getting cable TV for the first time. We're a bit fortunate in that we don't have the old VHF infrastructure in the ground that you've got here. It's not just Australia. Right

through Southeast Asia they are deploying cable TV. It is the scheme that Mark discussed that is a combination of coax and fiber. We've got multiple carriers committed to spending typically around the six-billion-dollar mark getting up to about 80 percent of the households in the major cities in the next couple of years. And it is something that one has to seriously consider.

I don't think it will necessarily impinge on the corporate usage, but for the home consumer and the SOHO market, the whole philosophy and the thought process in Australia is your Internet access and all your on-line access is going to come via this fiber and this coax. And in one particular carrier's case it is a 10-megabit Ethernet that they are in fact deploying into every house as well as all the cable TV home shopping. So it's something to certainly watch.

Joel Maloff: John?

John Curran: I would like to agree with that. I think we have seen that cable through some of the trials that have gone on in the past and some of the activities going on now will be a very effective, high-bandwidth source for Internet connectivity but it may not be necessarily the platform for the business as much as it is the customer or the consumer market. And the questions that come up from that basis when you have mission-critical applications that we have right now on the network, people who are building their businesses on being on the network, there are certain service levels and service metrics which in the telephony world have been worked over time. And in the cable market there hasn't been a demand for certain response levels, certain monitoring levels. To that extent, it is going to be some time before there is enough demand to warrant that level of service out of the cable plant. I think we'll see very high bandwidth and I think we'll see very cost-effective delivery of service for the consumer market. I am a little skeptical about the penetration into the traditional business marketplace, particularly as businesses reengineer their processes onto the Internet.

Joel Maloff: Alan?

Alan B. Taffel: Well, I'm glad John made that point and I fully agree with it. I guess what we are all agreeing on here, the bottom line is that cable is not going to be competitive with Internet services. We see it as just another way to gain access to the Internet. Today we use many different ways to get access to the Internet, dial, now we have ISDN, which used to stand for an "idea subscribers don't need" and now it actually appears like it may actually do something useful. Frame relay is a good way to get on the Internet, that's a different technology; leased line, SMDS. And cable will be just yet another way that you can get access to the Internet, as will wireless, for example. I agree with John, though, that it is mostly going to be a boon for consumers rather than businesses.

Joel Maloff: Well, since we seem to be agreeing with each other on the panel, let me throw out a more contentious question. I would like each of you to address why you believe your company will be the dominant player either nationally or in your niche eighteen months from now.

In other words, Alan, why is your company going to be the dominant Internet access provider in the United States or in the world eighteen months from now?

Alan B. Taffel: Well, I'm glad you asked that question, Joel!

Joel Maloff: And, by the way, the rest of you can disagree with him.

Alan B. Taffel: And I'm sure they will!

I guess the first thing is we might still be here, since we're actually starting to make money now. We are actually a profitable company now. Which I don't think is a very common scenario in the Internet these days. But the real reason is scale. I think in a word the key to survival in the Internet business, at least it is our belief, is one of achieving significant scale so that you can not only deliver services wherever they need to be delivered and to a large population but you can do so profitably so it becomes a viable business venture. Without scale, that's not possible.

So I believe that our alliance with Microsoft is something that has allowed us to very quickly achieve the scale that is necessary and thus our early profitability. But I also believe that because we are squarely focused on a particular market, which is the corporate market, all we are doing is talking to business customers to understand what their needs are, we will be able to stay ahead of all the other providers with respect to the value-added capabilities and the integration required to make the Internet not just a communication vehicle but to make it an actually useful business tool, to make it the most reliable, to make it the most secure and the most accessible tool possible. That's what we are squarely focused on, and I believe that focus is the key to success.

Joel Maloff: John, why is your company going to beat out Alan's as the most dominant Internet provider in the United States or elsewhere?

John Curran: Well, clearly Alan has touched upon some of the success factors, and they include scale. They include the ability to handle and focus on a particular marketplace. BBN Planet has focused on the business marketplace. We don't serve the consumer marketplace. We are a provider much in the same way as UUNet; we are a provider of technologies, integrations. We built some of the largest networks that exist and we are behind the scenes in many of the consumer services, many of the larger government and military networks, as we have been for twenty-five years.

The good news is that the Internet is changing. Okay? As I sit here, a thousand lines of code are being written during this session and put out on the network somewhere. And that change is a remarkable thing. BBN is actually — The home of BBN is a laboratory. We are an R&D environment where we are watching what's happening in the Internet. We have been involved in the development of all the technologies and figuring out how to use those technologies for business.

As we sit here today, when you ask eighteen months out, I will tell you it's a different Internet. Now, BBN has 1700 people, engineers who are busy working on Internet technologies. As it turns out, Planet, while we may only have three hundred people, we're busy doing the application of that. I am very thankful that a year, year and a half from now we will be able to respond to the needs of some of the largest companies, making sure that they have their Internet solutions that they need, including security, as we've been a leader in before, connectivity, and similar services. That we will be able to address their business needs eighteen months from now, including the needs that we haven't seen or we have only seen in the R&D lab.

Joel Maloff: Mark, let me ask you, what regions do you hope to be able to dominate or areas in the next eighteen months and why will you be able to beat out UUNet or BBN Planet?

Mark Fisher: And of course we are now framing this in terms of the California market. I get to reset the scope of it. But clearly the opportunity we see is not among switching presently connected businesses in California from one provider to another. It is absolutely reaching into the market of businesses who have yet to understand the full value of an Internet connection. And the reasons why we will be successful and a dominant player in that market, no question in my mind, we are a name that customers know and trust and have learned to trust over the last several decades. They understand that the Internet is fundamentally a communication and network service and that that's the core of the business that we're in. We deliver the kind of service and support, our commitment to California, that makes people continue to do business with us. Even as the Internet changes and many other issues around telecom reform and regulation will change, the fact of the matter is we will bring a simple, convenient, affordable solution. It's the one place a customer will need to come, whether consumer or whether a business, to get their basic communication services, their phone line, their data services and their Internet connection.

We want to make that simple and affordable, and with it scale well so that we can reach a very broad base of new customers who are coming onto the net in California.

Alan B. Taffel: Can I comment on that while we're still in the U.S.?

Joel Maloff: Sure.

Alan B. Taffel: I actually don't think it is fair or appropriate to reset the discussion to just California. I mean, it is fine for a company that is just based in California and has no offices outside California to consider a solution, a regional solution like Pacific Bell can offer. But how many companies are there really like that? Why would a company that's got offices all across the country and indeed all across the world want to take on a solution in California that is not extensible? Take on a solution that forces them to go with all of their other offices to look for other providers, all of which have different pricing schemes, all with different billing arrangements and points of contact for service that's going to be a nightmare, et cetera.

I think that for any company that has got a national presence or an international presence, they should look for a provider that can provide a single solution for all of their locations. So that's why I think —

Joel Maloff: Well, that's interesting, but I would like to hear a response from some of the regional providers.

Mark Fisher: A very good point and very well-taken. But, again, the numbers, if you will, 1.4 million businesses in California. Almost 85 percent of those are fairly small to medium-sized businesses who do business in California and have no other sites in other parts of the country that are of direct concern for them in terms of an Internet connection.

I think there are issues with very large companies, the Fortune let's say 2000, and how their Internet needs are met. I think, frankly, for those Fortune 2000 companies headquartered in California, we can meet those needs or at least a good portion of them. But let's face it. The real opportunity is the businesses that have yet to connect. And predominantly we are talking about small, medium-sized businesses, and a regional solution is in California a very good one.

Rael Kuperholz: Just to take that a bit further, I agree with what Mark's arguments and Alan's were, but you can take it one step even broader now. You're only talking United States. I'm involved in a project at the moment for a company that is in the Fortune 1000 for the world,

that One Thousand World List, and they have asked us to cost out and how we would be able to deploy e-mail for them for two and a half thousand offices all around the world. And you come up with a discussion now, you see how you've got UUNet who are largely, your main infrastructure is the whole of North America or United States; you're just in California; I'm in the eastern seaboard of Australia miles away; and BBN throughout America.

Now, what happens in a situation like that where you've got companies like IBM? They'll claim to have a worldwide presence on the net. You've got AT&T Mail, who are pretty widely spread. You've got MCI Mail and you've got MCI common shareholders with British Telecom. And if you look at different parts of Southeast Asia, where I'm sure a lot of American companies have manufacturing plants, and facilities in China and Taiwan, Philippines, Indonesia, and so forth, you will find not one carrier is dominant in all those regions. AT&T is big in India, British Telecom is big in Thailand and Sri Lanka, for example; AT&T aren't there in a big way. So to take that whole question further, what do you do for truly international organizations?

Joel Maloff: Take it!

Alan B. Taffel: Well, just a second. We are going to be in twelve countries outside the U.S. by the end of this year and we will be in over a hundred countries by the end of next year. So what you do for a truly international organization is, use UUNet.

Joel Maloff: You're saying we should wait?

Alan B. Taffel: It's coming very quickly. And, anyway, we have arrangements and alliances with Internet providers and direct connections with Internet providers all over the world more than anybody else that I know of.

Joel Maloff: Wait. We have a comment from the audience. Yes, sir?

M: Is Microsoft going to buy you out and UUNet's going to go away?

Joel Maloff: Is Microsoft going to buy you out and UUNet's going to go away, it's just going to be MSN?

Alan B. Taffel: It is impossible for Microsoft to buy us out, contractually. They own 15 percent of us and there are limitations on how much they can buy. It doesn't get much above that. So, no, there's no way. They have one seat on our board and the board has nine members.

Joel Maloff: I'll walk around down in the audience. If there are other questions you want to throw at these folks, I will be able to pass them on a little better. Anything else you want to throw at them? Yes, sir?

M: I want to ask how specifically having a worldwide solution is going to help these businesses?

Joel Maloff: Okay. The question is specifically, Alan, you've been very big on the fact that a worldwide solution is necessary for businesses. Why?

Alan B. Taffel: Mostly as a matter of convenience, really, so that you have the same user interface at all points in the world. You can have roaming people. There's a lot of international

travel, you would like to be able to dial, for instance, locally wherever you are and still be able to use the same services, your same ID and log-on. Those are some technical sides.

From the business administration side it would be nice to have one billing model that applies worldwide and to in fact have a single bill, if that's what you want, come to the headquarters wherever that may be and then it can be billed back to the individual divisions or whatever. But those kinds of flexibilities, administrative flexibilities, are possible when you have a single provider that has a truly global presence.

Joel Maloff: Now let me throw a question at that. The concern that I immediately have is, not everybody speaks English. What are you going to do about user interfaces for Indonesia or Malaysia or Taiwan? How do you address that? And that's to the whole panel, not just to Alan but anyone who would like to answer.

John Curran: To be fair, you asked a question that started this which is: In eighteen months, how will an Internet provider dominate their market segment? And eighteen months is a long time. I'll just indicate that the Internet is now opening up as a marketplace. As was mentioned earlier by Mark, we have new tiers of businesses entering the market. We also have new channels, new partners. And in many cases you'll find out that as the Internet matures as a marketplace and you see a tier of resellers and OEMs, you will find that they bring the help desk support and some of the scale that is necessary to handle local-language support. So I think we will see a number of answers there. But you have to wait some of the eighteen months to see how the questions work out.

Joel Maloff: Other responses from the panel? Yeah, you have a language problem in your own country, don't you?

Catherine Smith: Well, do we ever! There are organizations out there, there's one called Video On-line which is stating right now that it is in twelve countries with fifteen languages. They are a marketing outfit; they are not a service of Internet provision. They will go to people who are looking to be an Internet service provider and try to sell them a very expensive franchised product stating, well, we've got twelve, fourteen languages, sixteen yet to come. They're not there yet. I don't think any of us are.

The way that we handle our affiliated offices, especially our one in places like Barbados and other outlying areas, is that we take the expertise from the people who are actually out there doing the work in those countries, people who feel comfortable with their service providers or people who want to be service providers in their own current language. It may be Mandarin, it could be Hakka, it could be Haikou. It is not necessary to be the UUNet in London. You could be Jones Internet Service Provider with a UUNet Technologies hookup. In a lot of cases we are finding that you don't have to wear a T-shirt, you don't have to hand out the buttons; you can be who you are, speaking the language of your country, with a good solid feed from an international provider.

Joel Maloff: Go for it.

Alan B. Taffel: I don't think you can be Jones Internet Garage service provider and have a hookup to UUNet. I mean, it does give you a local presence but it doesn't give you the same quality of service. It doesn't give you single point of accountability and that sort of thing.

The important point here is that we are not going to just do this by ourselves and not have local partners. That was John's point and I think it is very important and I want to

reemphasize it. The important thing is to have a common technology across the world specified by one company. Have mechanisms for common billing and have mechanisms for support that doesn't get into a finger-pointing situation between countries, for instance, but still leverages local partners that do speak the language and can provide local support. That's the ideal, that's the best of both worlds, that's what we are intending to do.

Joel Maloff: All right, we have another question from the audience, and the question is: For those of you that are international or planning to expand, especially in Southeast Asia, how do you plan to meet the regulatory constraints in Singapore, Hong Kong, or other countries that have those today?

Rael, you have service in Australia. Are you planning on moving into other Southeast Asian countries?

Rael Kuperholz: Yes. And having done a lot of work in Singapore and Malaysia, we are talking to organizations there already. The only way you can do it is on a joint venture basis. But one just needs to have a lot of patience. It's very expensive and it has to be done as a joint venture. You need local partners to be able to cut through a lot of the red tape and get through a lot of the regulatory issues.

But if you take Malaysia, for example, they take their feeds up largely from Singapore and it is only one carrier and it is fully regulated and it is really up to them to decide what kind of bandwidth they are going to give you. A lot of these countries only have a single 64, maybe 128K line coming in as their total Internet connectivity and it has been largely done for the universities and academia. You have to do it with local partners and tread softly, but there's a huge amount of interest in those countries, an enormous amount of interest. And I think somebody local within each of the countries will certainly realize, well, they are realizing now that there is a substantial amount of money that they could possibly make, and that's going to drive it.

Joel Maloff: Well, you make an interesting point. And for those of the networks that are on the panel that have worldwide designs, how do you intend to address the issue of Singapore or other countries? Alan, Mark, or John?

Alan B. Taffel: Well, yeah, going back to your original question how are we going to address these issues, we talked about countries; the short answer is one at a time. I mean, there's no way around the fact that you've got these regulatory requirements in each country. There are various options in countries that just have various strict requirements. One is to purchase a large Internet provider in that country. That's something that we are in the process of doing. We recently announced that we are acquiring UNIPAM PIPEX, which is the largest Internet provider in Europe and dominates the U.K. Internet market. So that's one approach. The other is as mentioned by the other panelists, that you can joint-venture with a company.

Joel Maloff: So, Alan, from your comments should we assume that you are planning on acquiring a Southeast Asian provider?

Alan B. Taffel: That would be, well, that would be speculation that was well-founded, yeah.

Joel Maloff: You heard it here!

Any other comments from the panel on that particular issue?

Now, to go back to the question we had asked earlier, we've got two, call 'em multinational or national providers and essentially three regional providers. To Catherine or Rael, how do you propose to prevent UUNet or BBN Planet from coming in, taking over your business? They have talked about how they plan on doing it. What are your responses that you think will refute their arguments?

Catherine Smith: We have UUNet Technologies Canada and at this point in time they have come in on a technical basis only. They lack a service commitment. I am still waiting five and a half weeks for their vice president of technology to call me back on a service call that they have yet to have addressed completely.

We deal with people, we deal with individuals, we deal with corporations. I can tell you that I know the name of every single user. I make a point of servicing my customers. I continuously travel to the offices that we have, and we are continuing to build affiliates with good, solid organizational skills. It is not a matter of transport. The transport is going to be with the cable companies, the TV companies, the telcos. And that's fine. Let them have it. We are building services in battlefields that have yet to be discovered publicly. Not that we can tell you about any of those yet and you will see those come up in the emerging six months to a year, I would think.

The key is to be in the battlefield that has not yet been spoken for, not to be flailing around in the one where everyone is at each other's throat.

Joel Maloff: Rael, let me ask you to respond to that.

Rael Kuperholz: Well, just going back to your question, John, Rome wasn't built in a day. And Alan mentioned that you've got to do one thing at a time. It is naive to think that somebody in the United States or somebody out of Europe, Germany, wherever, can just launch into other countries and go in. Having a lot of money or fistful of dollars is not going to succeed for you. It's been tried in all different industries and 99.9 percent of the time it's a horrid failure. You need to partner with local organizations who know the local bureaucracies. They have a reputation that is good amongst local business; they understand the way to work; they understand the culture.

I am quite sure that our help desk operates very, very differently to the way UUNet would. The reasons why people deal with us might be different. Their expectations amongst the customers would be different.

I hear continuously, a good example is, Australians come over or New Zealanders and they can't stand all the interactive voice response and waiting fifteen minutes to be told that number 9 is what you really want, dial 9, and then you get in another queue and then the phone rings out. Things like that that, say, people in the United States might be accustomed to because of the size and the volume of everything. People in Australia consider that pretty ordinary service. So using us as an example, and I've also lived and worked in four different countries and now Integration Design as a company has done installations and worked in eleven or twelve countries now, and it's just been so different, and we've always succeeded because we try and use somebody local.

So I think there's a great place for us in partnering up with, whether it's a UUNet or a PacBell or BBN Planet or anybody. If we do it right now in whatever foreign country it is and we've got the right credibility, we're their ticket to instant success. Their resources, possibly their finances and financial support, coupled with what we have to offer is your recipe for fast-tracking a success plan or a successful implementation.

Joel Maloff: Let me ask, if there are any questions from the audience, we'll take one or two more. Let's go with you, sir.

M: [Inaudible]

Joel Maloff: Okay, the question is for dial-up access or ISDN, for each of your networks, what is the ratio of dial-up or access lines to customers? Do you have one? Is the question clear?

Catherine Smith: The question is clear. The problem is that the answer is a difficult one more than anything else. We can throw ratios up and I've heard a lot of those today and I've heard them for the past months, and that's not something that you can judge. My dial-up customers come in, they may stay an hour, they may only read mail or be in ten minutes. Out of all of the users I have, I can guarantee you that one hundred percent of them are not going to be on-line all the time. So that we keep a number of quiet modems if things get busy and we will turn these up. Usually we know exactly how much usage our modems are getting. We address the issue of busy signals continuously, and we monitor them to be sure we don't have as many busy signals as we'd like. We're a smaller organization, we're far more intense with regards to our monitoring of modems and dial-up facilities.

Joel Maloff: Anybody else? Mark?

Mark Fisher: Again, to answer the question in a way that is traditional for our network purposes, there are design considerations, engineering design considerations like this. Alan had mentioned earlier P01 or P03 or P05, and our actual objectives are in the 99 percent range from an engineering standpoint. But that actually assumes a base of customers that are not yet on board, so we have absolutely overengineered the network in terms of ensuring that anybody who calls in will not get a busy signal. And there are some other interesting tricks, which I'm sure the rest of the panelists are familiar with, you can play when you design the network so that if you do have an overflow situation in one particular local POP, you can forward calls to another POP where there's capacity to take calls. Again, these are the kinds of things that we deal with, capacity planning, arrival times, average session length for folks on-line, on a daily basis. So this is actually at the core of the kind of network we design to serve people well.

Joel Maloff: John?

John Curran: Because BBN Planet has served traditionally the business customer base, we don't offer really dial-up services. Our services are leased line services and they're there all the time, so there is no commitment issue of over-subscription there. We are involved in the network operation of a number of very large dial-up networks. We work with — We're one of the providers of dial-up network services, for example, to AOL. The networks that we engineer there, I can just say, there can be very large ratios of number of customers calling in to number of lines, but that's because of the average customer usage. If you are looking at an on-line service, the average customer usage in hours per month is very different than the business dialing up to get their electronic mail.

So I guess in a particular segment there might be an answer to the question. We don't in and of ourselves offer network services based on dial-up right now, so it's not really applicable. Even then, you should think about trying to phrase it for business customers or consumer or even on-line access, because there's different usage patterns. What seems like a very high over-subscription level may in fact be very low if the average user is only ten hours a week.

Alan B. Taffel: I think that it is clear that there are several classes of business customer that do need dial service, that that is the most appropriate solution for them. In particular, small offices. And that's not to say small businesses. Small offices, which could be branch offices of a very large company. Dial service may indeed be the most appropriate access for them.

As far as the ratios go, I will be happy to answer directly. As you know, we have built this network for kind of two constituencies, one that is using it mostly at night. The dial network, that is, not the leased line network. The dial network, Microsoft people largely use it at night and Microsoft has asked us to engineer that network to a ratio, well, I'm just trying to think right now — I think I'm not allowed to say that number, actually. I'm sorry.

Joel Maloff: Can you give us a range?

John Curran: Positive integer.

Alan B. Taffel: Positive integer! There's a technical guy next to me.

Let me just say, I'm sorry, I was going to give the number but I just realized I probably shouldn't. But I think the actual important number is the peak rate of service, which means the probability that you're going to get a busy signal. That directly tells you the net result. Because the ratio all has to do with your chances of getting a busy signal, so why not just quote that number directly instead of trying to extrapolate it from a ratio.

And we do engineer the network so that there is never more than a 3 percent chance of busy; always less than. That's called a P03 grade of service. And like Mark's network, ours is engineered for millions and millions of Microsoft network users that haven't gone on-line yet and it probably will take quite a while to ramp up, so your chances of getting a busy signal on our network for quite a while is virtually nil.

Joel Maloff: Any other comments from the panel? There was one other question from the audience. Did you have one, sir?

M: [Inaudible]

Joel Maloff: The question is how much capital investment you have. Now, we have five different types of providers with different services, but I think the question is: How much did you have to invest? Are you talking about initially, sir, startup capital or going today?

M: Today.

Joel Maloff: The question is today.

Alan B. Taffel: I can be first because I'll be the quickest. I have no idea. I'm sorry.

Joel Maloff: John, do you have any idea?

John Curran: I guess I have to echo Alan's response. I'm not sure of the right number. I will say we have 25 years of internetworking. And there's a lot of intellectual capital, software rights that come into BBN Planet. So it's a nontrivial number. We use, for example, tools in our network operations center that were developed in BBN for managing very large networks. That is part of the asset base that we bring when we go to operate Internet services.

Joel Maloff: The question is hardware, John, not intellectual. Do you know how much hardware?

John Curran: It's a — I do not know. A very large number.

Joel Maloff: Okay, megabucks. All right, we've got three networks that are smaller or relatively new. Mark, can you comment on the question of how much capital investment you have had to make to get PacBell's service going?

Mark Fisher: No, I can't comment directly on the specific investment for Internet. But I want to say as an indirect way of answering the question, the company's commitment toward advanced communication services, included in that of course is Internet, as well as the cable TV network we are constructing in California is a \$17 billion expenditure which includes capital and expense over the next roughly twelve to fifteen years.

Joel Maloff: Let me address, since Rael and Catherine's networks are smaller, Rael, if you had to estimate today for your network how much capital investment you have, is it a number that you could share with us? And these are Aussie dollars.

Rael Kuperholz: I'll do the conversion from Monopoly money to real money. It's not something that I've really sat down and costed because of Integration Design's involvement. As John said, there is a lot of intellectual property and other actions and tasks and things that have been done by people in Integration Design. But if somebody wanted to go and set out anyway and just start up themselves and buy bandwidth from a UUNet or PacBell, BBN, or whatever and resell and do a decent job, I wouldn't suggest that out of one single city they try to do it with maybe under four, five hundred thousand dollars, and that's U.S.

There are certain basic things you've got to buy and you've got to set up. But a lot of your ongoing costs, a lot of your capital costs are incremental. As you sell more lines, you can incrementally add hardware. But there are certain core things that you need like setting up a help desk and setting up your main routers and setting up your infrastructure and putting your design together and your main news servers and mail servers and Web servers and things like that that you just can't avoid.

Joel Maloff: Catherine, did you have a response to that?

Catherine Smith: [Inaudible]

Joel Maloff: Alan, did you have a final comment on this one?

Alan B. Taffel: Not on this. But I would like a chance to respond to the snipe at UUNet Canada.

Joel Maloff: Sure. Take it.

Alan B. Taffel: Now is okay?

Joel Maloff: Absolutely.

Alan B. Taffel: I just want to clarify this. There is a company in Canada called UUNet Canada. It is not controlled by UUNet. We have a minority interest in that company and unfortunately

they do have the UUNet name. And I would like to agree with Catherine wholeheartedly that the service that this company provides in Canada is awful. And we are in the process of gaining control of that company so that we can either completely revamp it or shut it down.

Joel Maloff: Great. Okay, the — Yes?

M: This is more for Mark. When the United States deregulates, are the RBOCs planning on, the PacBells and stuff, doing anything in the international arena?

Joel Maloff: I think the question is primarily for Mark on this one. With the pending legislation in the United States Congress, when the regional Bell operating companies are relieved of their modified final judgment constraints, do you as Pac Tel and your Internet service plan on going national, international, or otherwise and can you comment on that at this time?

Mark Fisher: Given telecom reform that's pending which we expect certainly will pass in some fashion, we would aggressively move into several areas of business. I didn't know how you wanted to restrict this, but certainly simply long-distance services, interLATA services is core to that. For the Internet it presents us with an interesting opportunity and that is to look elsewhere or out of region, potentially, for providing or expanding the base of influence we have. We will be careful and deliberate about where and how we intend to leverage our California base and our commitment to California elsewhere out of region. In the short run we see California as by itself a very attractive market to serve well right now.

Joel Maloff: Do you think it would be possible, Mark, that you might want to acquire a company like the ones sitting at the table? Can you comment on that?

Mark Fisher: No!

Joel Maloff: All right. I'll take one more question from the audience. Are there any others?

John Curran: Joel, can I comment on Mark's response briefly on deregulation?

Joel Maloff: Yes.

John Curran: Deregulation is going to be wonderful for the Internet because it will enable another class of providers, organizations that have traditionally been local exchange carriers working in a particular area, to now go and provide Internet services. Likewise, it will also open up the Internet because it will enable other companies such as IXC carriers to enter the local markets and do direct access.

In many cases the Internet is suffering; there's places where we have chronic problems which can be tracked down to a particular interexchange carrier, a particular local exchange carrier. And competition will allow us to bypass that and cut around. I actually hope for a more reliable Internet, a more robust Internet as a result.

Catherine Smith: I tell you, in Canada I look for Internet to be in Canada. We don't have very much Internet in Canada because we're so darn big! We are finding that we are waiting for the telephone companies. No offense to Mark. In our case we've got areas that are using cellular and microwave at 9600-baud lines just to use the telephone.

So in Canada, as large as we are, all of our cities are closer to the border so that we are looking to our telephone companies for remote service so that we can actually provide Internet services up in the northern reaches.

Joel Maloff: All right. I am going to bring the session to a close. I would like to thank Mark Fisher from Pacific Bell, Rael Kuperholz from Planet Internet in Australia, John Curran from BBN Planet, Alan Taffel from UUNet Technologies, and Catherine Smith from UUNorth International in Canada. I think they have all done a great job. At this point I don't know that we want to decide a winner. I'd just like to give them all a hand and thank them very much. And thank you very much. I hope this has been useful for you. Have a good day.

(Applause)

INTERNET TECHNICAL AGENTS, DIRECTORIES, METASERVERS...



SPEAKER

Matthew Koll, Ph.D.

President, Personal Library Software

Matthew Koll: Thank you for coming. Speaking of agents, I was thinking about agents trying to start this talk and I was reminded of that very old, bad joke about two guys who are going to be roommates. They were unpacking their bags and one guy has seven socks, one for each day of the week, and the other guy says, "Gee, I have 12."

The point is that more isn't necessarily better, and as my agents — I have a personal news agent on my desk that I've been trying to train for the past several months, and for a while I had it delivering stories whenever something interesting happened in the Web marketplace. After a few days of getting "pinged" every few minutes, I scaled it back and said, "Okay, how about once every four hours," and then I scaled it back to once every day.

So agents are a powerful capability, and we'll talk a little bit more about it as the rest of this talk proceeds. The jokes don't get any better, though.

I'm Matthew Koll from Personal Library Software, and this is my one-man show. We use the words "Personal Library Software" as our company name because the idea is to turn the entire world into your own personal library or have a personal librarian, if you would. Let's just give you about three slides on who we are to keep my board happy and to establish at least some credibility that maybe I have something to say about this subject.

At Personal Library Software, our mission is to bring people and relevant information together. That's a very broad mission, and we do that in really two different ways. We have a long track record of developing and marketing search software.

The latest is a product that we call *PLWeb*, which is an Internet search server that is being used very, very widely on the Web. We also have a long tradition in CD-ROM and enterprise-wide information servers. We've been doing that for about 13 years now.

So, we were doing concept searching, natural language, relevance ranking, relevance feedback and all that stuff before it was cool. The other thing — which I'm not going to talk too much about directly, but is really driving this presentation — is a new project that we've been working on called *At One*.

It is not working yet. You could call it vapor if you like; it's just beginning its pilot phase. And the idea of *At One* is to take advantage of the installed base of *PLWeb* servers and the many people who are doing intelligent searching on the Web — and people who aren't quite on the Web yet — and create a directory, a different kind of guide to where relevant information can be found.

So we'll talk about some of the concepts behind it without going into the products at all, really. And lastly, before we get started, just to give you an idea some of the places our software is, [it's in] some of the most powerful and exciting Web sites such as *Pathfinder* from Time Inc., Time-Warner now. AT&T Net and McKinley's Web sites use our software, and we just announced phillipstock.com. Phillips is a business newsletter publisher, and has a wonderful plethora of newsletters. We just made that announcement yesterday. [They have] *Electronic Newsstand*, *ZIF.com*, *The WELL* and so on. So we have a lot of experience with big databases; I would say we have more experience with big text databases than anybody else in our industry.

So, having thought about concept searching and information retrieval, and relevance ranking and big databases for a long time, I was really excited to get this opportunity to talk about what I think is the next really big issue, which is the idea of directories, agents and meta-searching. How do you figure out where to look?

M: Just a logistical question. Will these five [inaudible] go on your Web site?

Matthew Koll: Sure. Not today, but probably tomorrow. We see ourselves along with many other people as fitting into this vast middle between the users and content.

There are X million Internet users out there, there are X million Web hosts and other content providers. Everybody wants to get their content up on the Web. How do you find that content? This whole entire conference really is a bunch of people trying to figure out how to put users and content together, certainly from the publishing side.

There are other things that people do besides search for information, but from where we come from that's one of the most important things that we think people do. They want information. They don't necessarily want to be searching for information, they just want to find it, they want to have it delivered, they want it to be there. And as middlemen, I think the thing that we don't want is this situation where you build a Web site and they don't come.

Or, you get out there searching the Web and you can't figure out where the information is that you want. According to the popular press — and I think the community by and large, the neophyte community of people who average less than ten hours a week on the Web — that's probably an accurate depiction of the way they feel about things.

For those of us who are spending a little bit more of our life on the Web, we've gotten a little bit used to these primitive tools that we have, but I think we all have a long way to go.

The biggest issue that we have coming up in terms of the content being available on the Web is the issue of scale. I'll show the next couple of slides trying to depict the issue of scale. But I think it's fair to say that in some number, a few years, we'll have several hundred terabytes, several hundred trillion bytes of information all on the Web, all totally connected, all available for intergalactic cross-database searching.

Maybe it's not two years, maybe it's seven years but it will be there. When you hear Larry Ellison or Bill Gates talking about information at your fingertips or the entire world being content-driven, I think that's the kind of volume of information we're talking about. And if we're going to get into the hundreds of terabytes range, how are we going to handle that?

The title that appeared in the proceedings said, "Agents, Directories, Metaservers, Servers, Filters and Scale Save the Day." I don't know where that came from; I think that was somebody being a little bit over optimistic on the copy writing. This is the actual title that I submitted, which was "How Do They Scale?" I'd like to think that they are going to be able to make profound differences in the way we search and find information, but I think we're at the very early days of figuring that out. We just haven't played with data on the magnitudes that we're going to encounter in a few years, so I think it will scale.

I think we've got some really good ideas about how to do it, but it's too early to even say the jury is out. I mean, we haven't even selected the jury.

Putting the question another way, if all the information in the world is at your fingertips, how do you grasp anything? When you have many, many agents sending you information, coming into your in box, more than you can figure out, the next thing you do is have an agent for your agents. And you start having to have an agent to monitor all your different agents that are coming into you.

I have an agent up on America On-line, I have an agent that's in our own office with a mainstream feed that runs against our software, I have other agents that I subscribe to. At some point you're starting to wonder, "How do I deal?" Information overload reappears.

To give you an idea of the magnitude of the data problem and how this just really compounds this experience, that black box represents [in] one year the full text of one or two

years of a newspaper. So a typical newspaper runs about a megabyte a day, maybe a little bit more, so in two years you're talking about maybe a gigabyte worth of text.

A sort-of-major but not huge on-line service such as Dow Jones News Retrieval or Data Times or one of the sort of the second-level in size — not in quality necessarily — on-line services have maybe 200 or 300-500 gigabytes worth of text that they have to search for right now, usually in a dial-up on-line X.25 kind of service — or, if it's available, starting to be available though TCP and starting to be available through the Web. But that's a lot bigger than the one newspaper.

Just for contrast I drew a white square in there to indicate the amount of data that is currently indexed by the most generous accounting that we could give for one of the webcrawler-type of indexes — *Lycos*, *InfoSeek*, *AOL WebCrawler*, these services that let loose a crawler to index all the text that they can find out on the Web.

Generally speaking, the amount of text indexed by those systems ranges between less than one gigabyte to maybe 30 or 40 gigabytes, if we're really generous and optimistic. The largest one I've seen is eight billion pages — and a page is usually 2-5K — with most of them really one million pages or less. So we're talking about just a few gigabytes, a little bit more than the content of one newspaper, for a couple years.

If we now look at a very large on-line service such as Dialog or Lexis-Nexis, Dialog or Lexis-Nexis is about four terabytes, four to five terabytes. Okay, so that really dwarfs everything else. And now, when we start thinking about what happens when Dialog and Lexis-Nexis and university library and everybody's chat groups and discussions and e-mail start getting up there, now we're talking about somewhere over a hundred terabytes.

And the tiny little speck, the green speck is Data Times, the little white square is the amount of index content from the most voracious webcrawler and the little black dot that was just one single newspaper is just about impossible to find.

If you've got all that information at your fingertips... I go back to when I used to teach information retrieval, and I used to ask my students as a final exam the question, "let's assume that you didn't have to worry about processing power or speed. Let's just assume that you had an infinitely fast computer, you have all the information there. How would you decide which document to give the user?"

Because that's really the fundamental question in information retrieval; you've got a user sitting there and the user wants to see. as the next thing he or she looks at, the document that is most likely to satisfy his needs.

How do you pick out that document? What do you do? What do we know from artificial intelligence, what do we know from information retrieval, from pattern recognition, any techniques we apply? Forget about speed, forget about timing, just what could we actually do if we had everything there and could process it?

It's a tough question, because most of the work that is done in information retrieval and database management stumbles on the issue and has to deal with the issue of efficiency. We do things with inverted files and bitmaps and hashing techniques to try and deal with the issue of speed and performance; but I used to like to try to get the students to think about this: what if we didn't have to worry about performance, what if we could just worry about effectiveness?

Well, one of the first things you have to think about in terms of effectiveness is that each word that the user is likely to use to search with occurs millions of times. [that's a] major problem for most information retrieval systems.

Just one of those numbers that floats around in one gigabyte of text — I believe the average word that the user comes to the search systems with, or does a query on, occurs 25,000 times in that one gigabyte of text. So a typical user comes down, sits down, types that

one word, and it occurs 25,000 times and retrieves 15,000 documents. That's a one-word search against one gigabyte.

So yeah, you can do some relevant one-word search, when you don't have an awful lot to work with. What happens now when we have ten gigabytes? Okay, that's 250 million. When you — excuse me, a hundred gigabytes would give us what?

Okay, let's say one terabyte gives us 25 million for the average occurrence. If we get up to the day where we actually have a hundred terabytes, we're talking about 2.5 billion occurrences of a word. So if you start to end up pooling combinations and anything like that, you're talking about identifying hundreds of millions of documents, all that satisfy any query you might come up with.

The upshot of all this is that straightforward indexing methods aren't going to work at that scale. Something else has to be applied. Step back for a second and say, "What are we trying to accomplish in searching for that information?" There are many different kinds of information needs; we're not always looking to find every relevant document.

Sometimes you just want to find any relevant document. "Find me something on the subject," which would be sort of any needle in this haystack. One of the most interesting searches that people do, which will become harder and harder to do, is the one when you say, "make sure there are no needles in this haystack."

How many of you have searched for a patent in a trademark database? You've got a great new name for a product, and you're just praying that you don't find a conflict. Or, if you're a lawyer, [maybe] you're searching and hoping not to find a conflict of interest. Many times we want to have confidence in a negative result of our search; I mean, that's the way I picked up the *Sunday Times* every month, or the *Monday Times* now; *New York Times* on Monday, pick it up, read all that stuff and say, "please don't change my day. Please, did [Mark Offerlewis] not write something that's going to turn the work upside down?"

Looking for needles in haystacks is one thing, but now we've reached the point with many, many terabytes, that the issue is where is the haystack. Which field are we in? How do we even have a clue of where to look? And it is pretty well-established research, that if you look at failures on the major on-line services — and this could be Dialog, America On-line, Prodigy, Dow Jones, any of them — one of the major reasons for people being unsatisfied or failing to find relevant material is they are looking in the wrong databases. They just don't know where to look.

Go back there. Traditional information retrieval methods that have been around since the '60s, since the '50s, are pretty bad if measured in terms of recall and precision, which are the two most widely accepted ways of measuring retrieval performance.

Recall is defined as the number of relevant documents that you actually found out of all the relevant documents that are out there. So if in the universe there exists a thousand documents that you would find relevant, and you found 200 of them in your search, then that's 200 out of 1,000, that's 20% recall.

Precision, on the other hand, measures how much noise you have, how much garbage you have in the set of documents that you retrieve. You retrieve a hundred documents, 50 of them are good, 50 of them are not relevant, that's 50% precision. And generally speaking, in on-line services the sort of ballpark performance that's been seen time after time after time in many, many studies is that a typical user retrieves about 30 to 50 documents, of which about half are relevant and half are non-relevant; but among those relevant documents that they found they usually only got about 20% of the relevant documents that were out there to be found.

This level of performance has been confirmed time after time, in independent studies by many information retrieval researchers. It's one of those things we can talk about why, and you

need to think about why in order to try to do better. [One of the] main reasons why it's so bad is one of overly-prescribed logic. If you're forced to use Boolean logic and phrase operators and things that narrow the search, you tend to force yourself away from lots of interesting and good documents that might very well be relevant; but if you have to go from 600,000 documents down to ten documents for sanity reasons, then you use the tools that are available.

And if the tools are Boolean operators like "ands" and "nots" and phrase operators, well, then you end up missing a lot of things that didn't happen to have the exact language that you thought of to ask your question, but still were highly relevant.

The second reason is that language is just imprecise. [There have been] studies of people asking other people to name objects; you know, what is this? Well, if you ask about 40 people what this is, you get about 38 different answers. It's incredible. But there is great research done at Bell Labs as well as a few other studies, and there is just an incredible inconsistency when people try to name things or to look for things with the names that other people apply to those things.

Now, what's a cup to one person is a glass to another person, which is a water glass to another person, which is just water, a drinking thing [to another], some stuff that you got up there as a twelve year-old would put it. We use different words, and then it's not surprising that you can't find those things that you couldn't figure out how to name. We need more hooks.

One of the things that I've been convinced of over the years of looking in information retrieval research is that the more hooks, the better. If you can use full-text, that's better than an abstract, better than a title; the more words you can expand the word out to, the more you can expand to a concept and find a concept instead of just keywords, the better the chance you have of finding those interesting things that you'd otherwise miss. And last, of course, [you avoid] looking in the wrong place.

So, how do we solve our problem? Well I think there are three main areas where we can make improvements. One is the interaction between the user and the system, and that means the way that we make the request and the kinds of advice that you can give the user. There are things that happen inside the engine, under the hood. How you do the relevance, how you do the concept expansion and then what is called "resource selection," which is where the haystacks problem [comes in]?

This is a very simplified, basic model of what we do whenever we ask an information system for an answer to our question. We start with a query and we pose that query to the system. If the system is intelligent, it does something to that query: it expands it, it spell checks it, it compares it to a thesaurus, it finds some related words through heuristic means. It does something; it tries to improve on the query somewhat.

Over from the other side you have a collection of documents, and you take that collection of documents and we build some kind of document space or index space, or some kind of collected index to those documents. Sometimes I like to call that a "concept space," because it sort of points you to the idea that what you're trying to do is make that concept space somewhat congruous to the concept space that the user has in their head, in the hope that the spaces are the same, [so that] maybe when the person asks the question the documents will be in the right place, the document space.

And then what you do is you compare the query to the document space, and through some matching function "M" — that's the matching function that ranks the documents by virtue of their conformance or similarity to the query.

This is a very general model, but every retrieval system that's out there, even an artificial intelligence, a true AI icon of a knowledge base system, ultimately falls back to that

kind of matching function. You might have slightly more complex matching function, but sooner or later you get down to the point of your matching for the existence of certain strings against the query. It might be an expanded query, it might be fuzzy matches but sooner or later you're comparing string matches to the query string and counting the hits in a more or less intelligent way.

If we introduce the idea of a resource locator or resource identifier or a "where are the haystacks" kind of function, what we do is we take the query, and before we apply it to a specific database or a collection of databases we go ask this thing that I'll call a "meta-search," a "meta-database" or a database of databases. You do this all the time in a less automatic way if you go to say, the *McKinley* and ask it, "I'm looking for some stuff on hotels, where would I go to get reviews of hotels?" If you ask the query it ends up pointing you to a Web site that's got a lot of information about hotels.

Well, you run the query against a metaserver and that metaserver — in this case I'm describing a scenario where the metaserver is, in fact, created from the document collections — so we let the document collections sort of describe themselves to this metaserver, and then the metaserver renders up to the searcher a list of the preferred databases, and then you proceed to go and search those databases. This has the advantage of limiting the search to perhaps a consumable quantity of a few gigabytes as opposed to hundred of terabytes.

Going down a little bit more deeply in terms of the things we can do to make searching better, on the interaction side I have three things: the interaction, the engine processing and then the meta-search.

On the interaction side, I think that first thing that makes systems better is a natural language query. You just can't force anyone outside of the library community to use Boolean logic. If you insisted they use "ands" and "ors" and other kinds of operators you will doom them to asking for things in ways that guarantee that they don't get them right.

On the other hand, if you go strictly with a natural language system and don't provide the user the capability of doing Boolean operators and phrased operators and field restrictions and other kinds of more narrowing kinds of operations, you will also lose lots of relevant documents.

Not to knock any of the existing webcrawlers, but we have a terrible company name, Personal Library Software. It's three common words, and it's strung together. Try going to various of the Web servers, the directory services and do a search on Personal Library Software. About five out of six of them failed dismally. Okay, you got things about library services, you got things about personal agents, all sorts of things, but you don't get stuff on us because they don't have a phrase operator or they don't have a ranking algorithm that takes into account phrases one way or the other. It's very frustrating, and we're trying to fix this.

The third thing is feedback. We are all much better at recognizing things than making them up. So if you can give the user some examples of relevant documents, if they see something on the screen and say, "Find me one like that," that's great. If they see words on the scene and say, "Oh that's a good word, that's a good word," I can take those easily and feed them back into the system and improve the likelihood of getting good results.

The second thing is this whole concept of "advisors," where if it's not just enough to work under the hood, I really think it works better if you interact with the user and give the user a chance to make that kind selection. If you give the user guide the concepts, whether those concepts come from a thesaurus or a web of some sort or if they are generated spontaneously, dynamically — which is a more powerful and certainly complementary technique — but [come up with] ways to give the user the choice and point out when they've made a spelling mistake, point out when there is a related word that they might want to use.

Of course, the problem we all face in trying to offer these higher power tools is to do them in the way that doesn't become so complex that the user doesn't want to use the system. Frequently, we find our Web customers doing a very, very simple "one blank, fill in the blank" search screen and then [moving to] a more advanced, sophisticated search screen for people who actually want to click on it and go to it. So it is a real tricky issue in human interface design to get these more advanced features into the system in an unobtrusive way and let the user ramp up into them.

Okay, with the stuff that goes on inside the engine, several things are really important. Obviously scalability. We're beginning to get to the point where some of the computer operating systems let you have single files bigger than two gigabytes, and that's pretty important, because when you start handling hundreds of gigabytes, if you can only put in a single two-gigabyte file and call it a database, you got a problem. So you have to start getting beyond these two gigabyte limits.

You have to have an adaptability to different environments. If you have a semantic web built for the medical community, that doesn't work real well for automotive parts or real estate. There are adaptive strategies to get a word concept associations out of databases, but I think there are promising and able to be generalized.

And again, as much as possible these things need to be dynamic, meaning that they are done with less human intervention as opposed to more human intervention.

Relevance ranking. Just to go over some of the basics — I hope this isn't old hat to most of you, probably not — but over all the years of information retrieval research there are three things that have come out that actually have a pretty significant impact on relevance ranking. When you're doing a search, whether or not you're using Boolean operators — it doesn't really matter whether or not you're using controlled vocabularies or just the full text, doesn't really matter — but a few things [are important] if you're going to try and identify the relevant documents and bring them closer to the top of the list.

One thing is what we call "IDF," or Inverse Document Frequency, and it's a very simple thing that says, "if the user uses a rare word and a common word, count the documents that have the rare word more importantly than the ones that have the common word." Okay, rare words are more important than common words when a user uses them in a search.

Within document frequency is sort of the obvious point that was made for the first time in 1957, and the principle was this: the appearance of a word in the document, multiple times, is an increasing indicator that the document is probably about the subject of that word. Somebody won a really big prize for that in the late '50s. But you'd be amazed how many retrieval systems are still out there that don't even do that basic thing. And that's just counting the hits, and it does help, but you've got to do it carefully.

We also want to take into account the document length, and what I call "concentration." Concentration and phrases are a pretty similar thing. Basically, when words occur near each other that's a good indicator; if the words are clustered tightly within the document, particularly if the user types in a phrase and the document actually has that same phrase, that's also a good indicator of likely relevance. But again, I stress this as a behavioral problem; this is not a computer science problem, this is not amenable to some theoretical proof, this is a question of does it work better.

I want to make sure that we're covering the bases, and since we're talking about agents and directories, metaservers etc., I just want go through some boring definitions and just try and clear the air with some of these things to make sure we're all talking about the same things.

First pet peeve; *Yahoo* is not a search engine, please. The folks at *Yahoo* would like you to get that straight, too. *Yahoo* is a directory service, like your telephone book. A search engine

is what PLS sells and Fulcrum sells, it's the thing that does searches, that goes inside of an application and lets the application have powerful full-text access. That is a search engine.

And I'm going to try, for the remainder of 1995, to fight that battle and get people [to call] those things search engines and those things directories. A search system is bigger than a search engine. Our *PLWeb* product, the *Netscape Publishing System*, those are search systems, much like a DBMS is a system. These are search systems; it's more than just the engine. It includes human interface code, it includes database loading processes, it includes update procedures, it includes document filters for getting things in and out of the database — there's a lot more there than calling it a search engine. The engine is the core of the little engine part, but the search system has a lot more to it.

A search service — I would call something like a Dialog or Dow Jones a search service. Okay, so *InfoSeek* is a search service and it's a directory service. Make a distinction between information retrieval systems and document management systems. DBMSs such as Oracle are introducing text handling, Informex and so on are introducing text handling, but there is a fundamental difference between the way DBMSs and text retrieval systems go about finding relevant information. There are technical differences in the way you do the file structures, there are operational differences in the way that you figure out if the results are good or not.

There are some fundamental differences there, and people have been trying to marry the two for a long time. We're in there pitching ourselves; we have announced a deal with [Alustra], who has some of what they call "object-oriented" relational technology. And we've integrated our text searching with their DBMS, and there is some powerful combinations there such as Oracle and other folks are doing [things], but they are different.

For example, one of the other things I'll try and cover a little bit is standards. SQL is a terrible way to look for information. SQL works really well for a structured query against a database; if you're trying to search for concepts within some huge collection, SQL is a disastrous mistake. So you don't want to use that language to do an interactive search, where you're trying to find relevant information.

Again, with an information base versus a database, we're talking about the issue of degree of structure. That's really what it is; a database tends to be highly structured and has many updates and transactions against it as there's searching, whereas in an information base we tend to be thinking more of the one publisher/many consumers, and the most general access is people searching for something as opposed to getting records out to generate reports. So it's different kind of structures.

Full-text index. Just to make it clear, most of the products on the market do in fact index every word within the document. I mean, you can use it if you want to, but that's really an option for most of the systems now. So, full-text means that everything that's there is searchable.

Concept searching is worth spending a little bit of time on just because it's beginning to be really bandied about as an abused term. I'll throw out my definition, but to me concept searching means the ability to retrieve documents that didn't contain any of the words that you thought would be relevant. And further than that, it's done without any human being having to have created that. No human being should have had to tell the system that this word is related to that word. The user shouldn't have said, "here are the words."

To me, true concept searching is when the system is able to figure out that this word should go and get mapped to a bunch of concepts — which of course get translated into a bunch of strings — and will find the documents that have those strings and show them to the user and rank them, even if they weren't any of the words that the user knew about.

To me that's the most interesting and fun part of being in information retrieval, being able to find things that you actually find relevant, but you really would have never done it any

other way. You wouldn't have specified these words; you would have never thought that these words were the right ones to look with. In a Web server — if you don't know what a Web server is, I don't know what you've been doing here the last couple of days.

"Metaserver" is some terminology that we're starting to coin in terms of something that figures out where the haystacks are. The word, the prefix "meta," has been used for a long time in the data models world to mean things that describe some other things themselves — so meta-data is data about data. So when we talk about a metaserver, we're talking about a server that guides you to other servers.

Webcrawler indexes, this is important. There really are — I said I'd talk about directories — I think there are three kind of directories that we should care about. There is one kind which is the human editorial-based directory, and examples would be *McKinley*, *Yahoo*, *GNN*, human beings sitting down and deciding that "here's a good description of a Web site, and if you ask me the right questions I'll point you to some good places."

A second type of directory that exists now on the Web are things like the *Lycos* webcrawler that has essentially a webcrawler or worm or wanderer or whatever you call it, which is something that goes around the Web and sends the text back to a central location or sends an abstraction of the text, but mostly sends cross-text, and then you build a central index like a regular text retrieval, a full-text index residing on the central server to all those locations.

That's what you have on *InfoSeek*, and that's sort of become a pretty popular thing. We now have four, five, six of these in operation. There seem to be new webcrawler-style indexes to the Web forming daily, and they're now up to indexing maybe a million pages — or in one case, eight million pages worth — of text out on the Web. The reason why I think that the third form, which is the metaserver, is required is because of where the content is.

If you remember back to those pictures, if there are only one to eight million Web pages lying around there, that's not a lot of data compared to all the rest of the data. Most of the rest of the data, though, is behind firewalls, it's behind subscription log-in accounts that you have to get to, it's inside structured databases or text retrieval databases where the owner of that content wants to control the access to it.

They're not — Dow Jones isn't sitting there leaving three hundred gigabytes around where anybody can get to it whenever they want. A typical example would be one of our customers, a small on-line service in New York, [*Home BaseLine*], that has some good number of megabytes, probably hundreds of megabytes of text all organized into databases, and if you subscribe to it you can log on and you can search, hit, and you can pay by the piece. But what a webcrawler sees, if you get onto any of the webcrawlers and do a search on the baseline service, if you type in "baseline" what you find is the two, three or so pages that are invisible above the firewall, the tip of the iceberg if you would. So a webcrawler can scratch the surface and they can even dig down deep in the publicly available areas, but they can't get into the real meaty content because content owners aren't about to just leave that stuff out there.

[Tape change]

Matthew Koll: Interactive search base versus agent in profile, can I contrast those? Sometimes I'm prone to say that an agent is just a query on the timer, that's only a little bit of an overstatement. You know, we used to call it "remote job entry" or "batch processing." Basically, there are two ways of doing the searches; you're either engaged in the process or you sent the messenger out to do it. And what an agent is a query or search that you've created, and you tell this agent "keep operating after I've dispatched you. Go out there and run everyday, run every hour, run on demand. Run on whatever schedule I can have you work and send me back the results." Really, at this point, that's what an agent is.

We think there is more progress that can be made there, and we'll get into that in a second. One distinction I would like to stress here — and this is something that I think is important in terms of scalability and survivability of the technologies into the next generation — is the issue of automatic versus manual.

And I think that's been a theme that's been running through this talk to the extent that there's been any theme. Automatic means that you don't have to do the labor-intensive things to make the thing work. Okay, manual things, such as human indexing, is a good thing if you've got it — if you can pay the labor. Semantic Webs, great, [but only] if you can pay the labor.

Okay, "whole cogent" models; if they're automatic they're much more impressive to me than if their manual, to the point that — without getting bogged down in the whole theoretical discussion now, but this does get down to a whole right brain/left brain, theorists versus empirical scientist, one side versus the other.

You got guys over here who have gone through classical computer science education, logic and theory, and you've got guys over here who have gone through behavioral science education, psychology and flight control, a great area — one of the things that I think has a profound impact on where this whole meta-searching and meta-navigation thing is going is the research on human factors, for pilots and folks like that who have to consume tons of information quickly. Because that's what we're trying to do, we're trying to figure it out — we got lots of documents out there, which ones might be relevant? So the whole issue of multidimensional display and how you parse through that very quickly visually is something that finally is coming of age.

Again, you know, the left side is — not that those are worthless tools, it's just that those are tools that tend to be a bit more manual-intensive, and the right-hand side tends to be the tools that are what I would call "emergent," and can arise on their own.

So, for example, classification versus dynamic clustering. Okay, it's one thing for a bunch of librarians to try and classify stories as they come in; it's another thing for a user to be able get on this system and just say "well, organize these for me."

Just to give you an idea of some of the concepts of distributed search, [let's move] right ahead here to a rather complex-looking diagram of a distributed search.

Talking about distributed searching, what that really means is if you look at just what's inside that square — and this is our product, but it could be other people's products as well — you have a browser connected to an instance of a search system, and that search system points to an index, one or more indexes — which is the little circle and that index points to a bunch of disks, hard disks, CD-ROM disks and so on. Your basic search system.

When we talk about distributed searching, what we're talking about is more than having text that's in other locations. Having text in other locations that you index in one place is good, that's an important thing, but the next big step and this has been taken by ourselves and some other companies this year, is to have full distributed indexing where you have multiple indexes in different places.

Different databases gather around the Web, and you can do one search that simultaneously, in parallel, searches with those other things and then combines the results into one merged, unified, relevance-ranked result. That is existing shipping technology — that's not vapor, it's not next year. That's real technology, and you can do that. In fact, anyone out there who has our *PLWeb* product can cut a deal with anybody else who has the *PLWeb* product and can make their databases look like they were one database to any users that you want to.

The reason I like the fully distributed model is that the distributed model also gives you sort of this "bottom up" approach to letting the administrator at the site do what they have to do to manage their own site. You're not waiting for some webcrawler to come and take over;

the administrator is in control of his or her own site, you get parallel searching and you get the maximum flexibility between having indexes locally and having indexes remotely.

The idea that the metaserver then introduced into this picture is that the metaserver says, “well, here’s a bunch of different databases out there, on different Web servers, ask the metaserver which ones are most likely to contain relevant information and then go back and do the search against those local databases.” So again, it’s a different concept from a webcrawler, and I think that metasearching — here we show the metaserver in the center of the picture as a master traffic cop, if you will, going back to the user and saying, “you know, look here, look here, look here.”

So the vision is to unite all the databases. Let’s embrace this hundred terabytes and say, “Okay, we’re going to get them all together, we’re going to organize it dynamically on the fly with minimal effort. We’re going to let it organize itself bottom up and let the content describe itself.”

Another great principle from the ‘50s is the basic principle in advanced information retrieval, [and that] is that the data can describe themselves, that the language in documents is really rich and you’ve just got to use a little statistics, a little bit of parsing perhaps, a little bit of stuff to tease it out and let the user interact with it. I think the methods are here, and when I say searching that could be an agent that’s searching as well as an interactive search. But advance searching — meaning natural language concept capability, relevance feedback capability, clustering capability and distributed searching — is absolutely vital if you’re going to have scalability.

Metasearching [is important] because you can’t look everywhere all the time [with] browsing recognition and interaction. Those features are where I think the true leaps are going to be. As much as I love information retrieval engines, I think the real innovations are going to be on the representation and browsing sites, so that you can just [inaudible] more about what these things are faster.

To jump ahead then to sort of review — we’ll have a quiz on the definitions at the end, they’re passing out blue books — I think that over the next few years there is going to be growth, and I’m going to call these “emergent” methods. So the non-deterministic, the ability to cluster dynamically to find words dynamically — I think that will start to prevail, these associative techniques, because they scale more easily. Multi-dimensional content representation is absolutely vital.

We finally have the bandwidth, we finally have the terminal, we finally have screens that we use. Some things that are more interesting; it’s a lot of research that was bubbling around ten, fifteen years ago, that a lot of UI guys just wish they could get out to the public. I think it’s finally going to start to come out now in the next few years.

And, of course, personalization. I mean, that is what agents are all about.

Agents are about getting your personal preferences in there, and it’s not just necessarily the words you like or the words that you put into your query. I do think an intelligent agent... To be intelligent, one of the things that I would say marks an intelligent agent is the ability to suggest new words to you, the ability to suggest words to add to your profile or delete from your profile that you wouldn’t have thought of. I think as we get into personalization of agents there will be lots of little things where you say, “Well, I don’t like this publication, I do like that publication,” and lots of little fine specific hand-tuning, but also the conceptual fine-tuning that comes from sensing which words work better for you.

I think I’m just about out of time, so I’ll leave it at that point, and it gives us about five minutes or so for questions. I’d be glad to entertain any.

M: How much thought have you given to [inaudible] different vendors searching? [inaudible].

Matthew Koll: Probably about an equal amount of thought and talking, which is a little. There have been some discussions. There has been some, a little bit of movement and it's conceivable that we'll make some progress in '96 on that.

M: I noticed when I use search engines that I'm offering a different person depending on the purpose of that search, and I'm wondering why there aren't more features that simply allow me to qualify myself as a novice or a professional in any particular search.

Matthew Koll: Why there aren't more? I think just because UI developers are overworked and laboring, like everybody else right now in this industry. It's a little bit hard to do. I think most people recognize that it's important to do. I would say one really good example, to plug another one of our customers, America On-line, I thought, did a really good job implementing the on-line database.

It's a Web database, but it's strictly on AOL service, so you just can't get there though the Web. But they have three different levels of interface — you know, simple user, moderate level of sophistication, and sort of heavy duty complex, and I think the AT&T site does that as well. I think we're starting to see more of it, it just takes a little bit more thought and care to do it that way.

M: [inaudible]

Matthew Koll: Well, I think what most of us do is that we search on words, and I think words are a pretty good thing to work on. You can search on arbitrary bits, strings, and there certainly is pattern recognition technology of the fingerprint variety that is good for searching generic patterns. And that stuff can be pretty impressive in terms of matching pictures and things like that.

I don't think the results indicate that is actually better for searching for words than the word search methods, because the word search methods actually get to take advantage of phonemes and things like that. Generally speaking, we just support abstract documents, HTML documents linked to anything [inaudible] documents, Acrobat documents. Links are links, and we're not really — we're just sort of ignoring them.

M: What does source [inaudible] keep up with this technology?

Matthew Koll: Certain [inaudible] says of information retrieval that the best source is the ACM special interest group on information retrieval, [SIG IR], which has manual conference proceedings and a newsletter. And really, in the popular press it's kind of difficult, it doesn't get covered in too much detail as [much as] maybe that's appropriate.

But there are some publications that go into it from the librarian's point of view, like *Searcher Magazine* and things like that, *On-line Magazine*. They occasionally will have articles that go into the searching and indexing capabilities, and every now and then there's a review in one of the PC magazines or something like that. But I think [SIG IR] is the best.

M: I noticed that there weren't any [inaudible] conference on searching, how you search.

Matthew Koll: I think most of the books that I'm aware of on on-line searching are really targeted towards librarians learning to use the older style on-line services. I can't think of anything. We've actually been trying to put some stuff up on some of our customer sites to

help make the help easier than just “well, try this and try that,” and hopefully it’s gotten easier to the point that you don’t need the full books on it.

You know, there are books on using *Excel*. I mean, I suppose there should be some books on that for language searching and using advanced search methods, but I’m not aware of any at this point.

M: What about [inaudible] if you want to dovetail? You know what I mean, that’s where you begin to searching words a certain way and [inaudible] Web site on traffic but you get Microsoft and a different text [inaudible].

Matthew Koll: Right. I don’t know. Somebody else did that? I thought we were the only ones. I don’t know. We’ve certainly given that some thought. I know it used to be a thing with authors, certainly in the information retrieval area, authors of research articles have been kind of sensitive to this for years. You know, you put words in the title and the abstract to make sure that when people are searching they find your thing.

M: Aware of how [inaudible] key?

Matthew Koll: I suppose it’s one of those things — with the camera being on you, the observer changes the thing — and I suppose that might be a good thing. Maybe if we’re a little bit conscious of the language we’re using, because somebody might be looking for this later on, so we’ll provide a few better bread crumbs for actually finding it. There’s a silver lining perhaps.

M: [inaudible]

Matthew Koll: Great. The statement was “Or you get in a rut and can’t think about things in new ways in which you still defy the language.” I guess I wouldn’t worry too much about that at this point. Yeah. Last question.

M: Did you see any [inaudible] point on the development search wizard and stuff like that?

Matthew Koll: I’m not privy to what their doing in Redmond on that. I would certainly think so; I don’t see why not. I think all of us could do a better job of help and advice and taking people through the steps. Absolutely.

Okay, well, I’d like to thank you very much. Oh, I should give you a plug for our booth. We are exhibiting down in 837, I believe. So you’re all welcome to stop by and harass our staff and tell them, tell them I sent you. Thanks.

INTERNET TECHNICAL PGP: ENVELOPES FOR YOUR E-MAIL



SPEAKER

Braddlee, Ph.D.

Network Information Consultant, NevadaNet

Braddlee: Good Morning. There are two handouts that are going to be circulating around. One is a reprint of an interview with Phil Zimmerman from Internet World from August, and the other is a four page handout of WorldWide Web resources on PGP and encryption. It's basically a list of URLs organized by category. So there are 100 copies of those, so if you don't get one and you would like one later, please feel free to come up and give me a business card. Also, both the resource list and the overheads will be available at the Web site listed at the bottom of the opening screen here.

And I guess we'll get started. My name is Braddlee. I am the Network Information Consultant for NevadaNet, which is the University of Nevada's Higher Education, NSF-sponsored, statewide mid-level Internet network for the state of Nevada. This talk is going to be on Pretty Good Privacy, or PGP. It was originally billed as Privacy-Enhanced Mail, although I would like to clarify something. PEM, or Privacy-Enhanced Mail is an official Internet standard which is actually different and separate from PGP. PGP does not conform to a number of the standards for [inaudible] and PEM products. And it is actually a little different, and we're going to talk about some of those differences as we go along.

So the talk is now titled "PGP: Envelopes for Your E-mail." My e-mail address is on the screen there. Please feel free to use that. And once again, both the handouts and a copy of the presentation materials will be available at the Web site, which is <http://www.scs.unr.edu/cs/pgpresources.html> — that's for those of you listening on tape later.

The first thing I'd like to cover is the all-important question: "Do you want to be here?" This is basically a general introduction to public key cryptography and PGP. This is not a technical discussion. We're not going to be going into the details of whether IDEA or Triple DES is better for the conventional encryption of files; that's not really the focus of what we're trying to do. This is a very general and non-technical introduction intended for novices, people who have maybe read a little bit about PGP in the newspaper or in magazines and want to know more about it, want to have an idea of how to use it, what it is and how to get it. So hopefully you're in the right place.

We're also going to address some of the current legal issues and concerns that are going on, both about PGP specifically and about the larger issue of encryption in general.

Okay. So, the questions that are going to be addressed: What is PGP? What is Pretty Good Privacy? What is the nature of the software, where does it come from? What does it do, and why do you care? What does it do at the level of, basically, how does it work? And why would you want to use it? What are the basic mechanics of public key encryption, and how does PGP work as a hybrid example of that? Where does it come from? Where can I get it, on the Net or from a commercial vendor? How do you use it? Is it legal? Is it legal to use PGP, and in what ways is it legal or not legal? Is it secure? Will it actually protect my files? And how do I get help with it if I need help?

PGP is a software package. It allows the secure exchange of e-mail, it allows the attachment of digital signatures to files and it allows the protection of files, for example on an individual computer. To back up just a second, how many of you folks are business users? How many of you folks are business people? Okay. How many of you are education? Okay. How many of you are government? Okay. I've been coming to Internet World for about the last

three or four times now, and each time when I ask that question the ratio of business people goes up and the ratio of other users is going down, which I think is kind of interesting.

Something that you ought to know as far as using PGP for commercial use — and we'll get into this a little bit more in a couple of minutes — but the RSA, the encryption libraries for public key cryptography that are used in PGP, are licensed for non-commercial use only. There is a publicly available product which is a commercial version of PGP called "Viacrypt PGP," and we'll talk about how you can get that. Most of the things I'm going to be talking about as far as this context are going to apply to Viacrypt PGP. The differences between the two packages are essentially having to do with the licensing; so for you guys, when I say PGP you can either think about it in the context of using it for your own personal stuff, or you can just put in Viacrypt PGP and everything in it will be the same, it will be applicable with the exception of version numbers.

PGP uses a hybrid of public key and conventional encryption. We'll talk a little bit about what public key encryption is and what conventional encryption is, and how PGP works as a combination of the two. People sometimes get surprised when they find out that PGP doesn't just use RSA, the public key encryption algorithm for encrypting documents or encrypting e-mail. It actually is a hybrid; it uses both RSA, which is the public key cryptography, and IDEA, which is I-D-E-A, which is a European-developed conventional encryption scheme. And we'll talk about why in a couple of minutes.

Again, RSA is the public key encryption. I-D-E-A, IDEA, is the conventional encryption, and MD-5 is the third element in here. MD-5 gets used for digital signatures, and it's a one-way hash function. Basically you think of it as "things go in, but they don't come out easily." It's a secure message digest function, somewhat analogous to a checksum.

A little about the history of PGP; PGP is written by Phil Zimmermann. He wrote the first version pretty much on his own, but now there's a development team which includes a number of volunteers worldwide — although the versions that are released from MIT and the people that are working on it there, because of the export concerns and export restrictions on cryptographic software, are U.S. and Canada-based. Phil was a software programmer, and he had an amateur interest in cryptography that just basically grew. It grew out of a concern for privacy and what the environment is like when cryptography is not available to people, and what the current on-line environment represents in terms of needing new tools and needing new ways to protect and secure privacy.

If you go downstairs there is a lot of talk about gathering data about individuals for marketing purposes or other purposes. And I certainly don't have any objection to that; I used to work for a commercial survey research firm, so it's not at all that I'm anti-business. But there is a balance between people having a right to privacy in their communications and a right to protect their identity, or even to anonymity in certain contexts, and the legitimate rights of marketers to collect data and information about their customers and to use that — the questions about who has rights to information about individuals.

Phil basically threw Version 1.0 of PGP over the wall in 1991. It was hastily finished and not really a complete product. The reason he did that was that there was legislation going through Congress at the time which looked as though it was going to possibly outlaw all public key cryptography, and he basically wanted to get the package out before that legislation was passed. It did not pass, however, there are a number of continuing concerns in this area.

Version 1.0 of PGP did use RSA as a public key encryption engine, and it also used for the conventional encryption something called [Basamatic], which Phil had developed on his own. There are a number of problems with Version 1.0. One, and the most serious one as far as most people were concerned, was the licensing. At the time Version 1.0 came out I was a co-sysop for the Electronic Frontier Foundation as a volunteer on CompuServe, and we had to

pull, at that point, the early version of PGP off of CompuServe because of the licensing concerns and the patent restrictions on the RSA encryption algorithms. RSA is patented, and the license and the rights are owned by Public Key Partners. The early versions were basically — there's some dispute about this — but the early versions were basically in violation of some of the patents, the patented rights of the holders.

[Basamatic], which was the conventional key encryption scheme, was not a particularly good one; so shortly after Version 1.0 came out, Version 2.0 came out and used IDEA as the conventional encryption engine. And basically the versions through 2.3a are sort of the pirated or outlawed versions. I don't want to put too strong a tone on that, but basically they were not necessarily legal and legitimate. There was a significant dispute about that.

However, from Version 2.5 on, PGP uses the RSA 2.0 libraries, which are licensed for non-commercial use. And it's been distributed through MIT, and in Version 2.6 and above there are no real legal questions as far as the rights to RSA and the software that's being used inside PGP. So if you're concerned about being street-legal and legitimate, from the perspective of being able to use the software domestically, then if you're using a Version 2.6 and above you're fine. The current version distributed in the U.S., through MIT, is 2.6.2. Okay? So if you get the current version from MIT you're okay. Yes?

M: [inaudible]

Braddlee: Yes. We'll talk in a second about Viacrypt and how you can get Viacrypt products. But yeah, there is going to continue to be that non-commercial restriction on all the versions that come out of MIT. I would suspect that would be now and in the future, until the patents expire. The patents expire on RSA in 1997.

Okay. Why do you care? Why would you want to use PGP? Beyond the sort of fun, recreational, secret decoder ring kind of aspects of this, there are a lot of changes that are taking place in our society that are being brought about by the widespread dissemination and adoption of information technologies. The Internet and the Web is only one example of this, but it's certainly one of the foremost ones.

A lot of people, and even people that I speak to in higher education who I would assume would be kind of informed on this at this point, are not really aware of the lack of privacy and the lack of security with most conventional e-mail, particularly Internet e-mail. Internet e-mail — you've probably heard this before, but it can be likened to sending all of your e-mail on a postcard, and you don't have an envelope. E-mail is essentially a text file with some header information that tells it where to go and where it's coming from, and the path it's taking to get there.

So one of the things that PGP allows you to do, and probably one of the most important ones, is that it allows you to have an envelope for your e-mail. It allows you to make sure that the electronic message that you're delivering is readable only by the person that you intend for it to reach.

Now, what are some of the ways that this can go astray? Some of the ways that this can go astray are simple human error. I have an unusual name; it's Braddlee, and it's spelled with two D's. People all the time are calling me and saying, "You're e-mail is broken." And my first question is, "How did you spell my user name?" And they'll almost invariably say, "B-R-A-D-L-E-E." And I say, "Well, it's B-R-A-D-D-L-E-E." Now, if you're sending me e-mail and you do it with one D and not two D's, it's going to bounce, and when it bounces a copy comes back to you. But a copy also is going to go to the System Administrator for your site. And that's a perfectly legitimate thing to have happen, because a System Administrator needs to know and understand what's going on with mail. And if you have an intelligent, responsible System

Administrator, like most of us do, that person is much too busy to do things like read your e-mail. But you can't presume that's the case.

And you may have a responsibility to other people. In higher-ed, one of the things that I'm seeing more and more frequently is that researchers are exchanging data sets over the Internet, either by electronic mail as MIME attachments or by FTP. One of my concerns about that is when it contains sensitive data about individuals. As a researcher you have a responsibility to protect the confidentiality and the identity of the people that you're working with, the people that you're doing research on. If you have someone and you say, "Jane Doe is a lesbian, she drinks more than 24 drinks a day and she is more than \$100,000 in debt," aside from Jane being in pretty rough shape that is information that you don't have any right to handle carelessly. PGP is a tool that will allow you to keep that information confidential and make sure that it doesn't get to anybody that it's supposed to not get to.

Basically, you want to use it when it's a case in something where it's nobody's business. For instance, two weeks ago I was in the process of negotiating for a new job, and the people I was working with down on campus, we were exchanging salary things back and forth; and there was no way that I was going to do that over e-mail, just because it was nobody's business. And the people that I was working with do not use PGP, so I was not able to have a secure transaction with them by e-mail.

Another example is if, in fact, it is somebody's business, like if somebody wants to find out what it is that you're up to for competitor intelligence, that type of thing. You know, I'm not particularly libertarian in my orientation, and I don't necessarily believe that the government has no role in the rights of individuals. A lot of people that are involved in this area do take that perspective. But I think that you have a right to assert your right to privacy.

When I see things, for example, on a Web site... The day before yesterday a posting came up from the Federal Register that the FBI, in the follow-through from the digital telephone proposal that passed last year, has proposed that they will be tapping and monitoring up to 1% of all the phone calls in certain selected geographic areas of the country. My guess is that probably means Miami's Dade County. I live in Reno, Nevada. Reno, Nevada is not really what you'd call a hotbed of organized crime or drug trafficking. But the thing is, is that you do still have, at least at this point, a right to use these tools, and it is probably a good idea to use them and make a pattern of using of them, and to help other people make a pattern of using them so that it becomes accepted as the standard and the norm that you do have a right and expectation to privacy.

[There are also] other sort of security risks. In addition to having bounced mail you can also have a situation where people are deliberately tapping in to the line. It is very easy on TCP/IP networks to follow the data stream, to put a sniffer on the network to watch the traffic going by. You can't just snatch any package out of the air anywhere on the Internet, but particularly in a local area network it's fairly easy to monitor and follow traffic.

How does PGP work? PGP uses a combination of conventional encryption and public key encryption. Now, this is probably the area in which we may lose some folks, I hope we'll avoid doing this. You can think of conventional encryption basically as working like a combination safe; you can put something in, lock it, and spin the knob, and if somebody else knows the combination they can come in and take it out. So if you have a pass-phrase, let's say, "The king is a fink," you give that pass-phrase to your friend Alice and then both you and Alice can get into the safe and decrypt the message.

Now, that works fine as long as there are just two of you that want to exchange messages, and as long as you're not ever going to have to change the key, as long as you're not ever going to have to change that pass-phrase, that key to decrypt the message. Because one of the problems with using conventional encryption is, how do I get you my key? If we're in the

same room I can give it to you; but if we're not in the same room I certainly don't want to e-mail it to you. I don't necessarily want to give it to you over the telephone.

And the problem is that if you have a group of people, all of whom want to be able to share information back and forth, you don't necessarily want to have everybody in that group all using the same pass-phrase, all using the same key. If they're all using the same key, then if one person's key is compromised the key of everybody in the group is compromised. So then you have problems with groups of users; you have problems with key exchange. But basically it's the simplest form, and that's been fairly conventional up until recently about how to do this kind of work.

Public key encryption, which became available first in 1977, was patented in 1977. It allows you to give away public keys, and you should think of the public key as having kind of a one-way function. I or you can give that public key to anybody. I can hand it out to each of you, I can put it up on the screen here, I can write it on the wall of the bathroom here in the airport or in Las Vegas. It's okay, it's not a problem, and I don't have to pay any attention to the security of my public key as far as distributing it to other people. The function of a public key allows me to have other people send me messages, which then I can decrypt with my secret key. The secret key I keep secure; I don't hand it out and I have a pass-phrase that's not written down anywhere. That's what I use to decrypt the messages to other people, and also to sign documents. Okay.

In public key cryptography you also have some key management concerns as far as distributing keys. How many of you are familiar with the government's "Clipper Chip" proposal? Okay. In the Clipper, which is for voice telephone rather than for electronic mail or for documents, public key management is handled through a key escrow system in which the government keeps each half of the key, and the only people that can listen in on your telephone conversations are you, the person you're talking to and the Government, if they have a court order — or if the system isn't broken.

There are problems with authenticating keys. I can have a key, a public key that says it's from Bill Clinton, but I need a way to be able to verify that. One of the things that PGP does is use key fingerprints, which means that I can use that key fingerprint. For example, if it's on my business card or if someone reads me their key fingerprints that they have for me back over the phone, and we both have a reasonable level of trust that we're talking to the right people, we can do that. So that's a way to authenticate the key.

One of the big problems with public key cryptography in the PGP model is in terms of revoking keys. If someone is looking over my shoulder as I'm typing in my pass-phrase, or if I have some other reasons to believe that my secret key has been compromised, I need to have a mechanism for revoking keys. PGP, at this point in time, doesn't do a great job of this; and that's because PGP has chosen to work with a very non-hierarchical system of key management, which is basically called the "Web of Trust."

One of the ways that you can also help to authenticate keys is by signing a key. If this gentleman down here gives me his public key, I know him and I can sign his public key and say, "Yes, I Braddlee, certify that this gentleman's public key is true. This is a true copy of his key." If someone knows me and they trust my judgment about how I would go about doing this, then they can extend that level of trust to that gentleman's public key and use it with a little higher degree of confidence. But that's a very tenuous situation, and it depends on mutual trust rather than any sort of real secure authentication.

And again, with counterfeit keys, it's the idea that it's easy to fake keys and that you really do need to pay attention to who they're communicating with.

Okay. How do I get PGP? Inside the United States, and again for personal use, PGP 2.6.2 is available from MIT. I put up the Web site there because it is, quite frankly, easier to get into

and use. The address for that, for the folks who are listening on tape, is <http://web.mit.edu/network/pgp.html>.

If for some reason you don't have Web access you can also get it from the FTP site at netdist.mit.edu. In order to get it from that site you first have to tell that to that site, log-in as "get PGP," with no password, and it will walk you through a series of questions regarding non-commercial use and export restrictions, which also apply to Web access. At the end of that process, if you answer each of those questions correctly you will be given a secret FTP directory which is changed every half hour. And then you can log-out from the Telnet connection, FTP back in, change to the secret directory and get the files.

Both the Web site and the FTP site will do reverse name service on your domain. So, for example, if you're connecting from a PPP connection you may have trouble with reverse name service on this, and you may actually have to log-in to a shell account and then use a connection that way. The reason it does reverse name service is to ensure that the domain that the software's being moved to is within the United States, because of the export restrictions.

Obviously it is not terribly difficult to defeat this; but that's not really the purpose. The purpose is to try to ensure that the legitimate distribution is happening through legitimate channels.

Inside the United States, if you're going to use PGP for commercial use go to Viacrypt. Viacrypt has licensed PGP, and also has a legitimate license to the [inaudible] since Version 2.4 of PGP. Their Home Page is <http://www.viacrypt.com> — that's a little better URL than the one that's on this resource sheet. So you may want to scratch out the one that's on the Viacrypt contact information and put this one in instead.

The current version of Viacrypt is 2.7.1, I believe. For PCs and Macs, Viacrypt is between \$99 and \$149 for a single-user license, and what you get with that is you get a manual and you get support, which is not to be underestimated. I would strongly encourage you, if you are going to use PGP or a public key encryption product, that you talk to the folks at Viacrypt. They have been involved in the PGP development process for a long time. The company itself seems to be very responsible and responsive. They've had a good presence on the Internet for a long time, and they seem like decent people based on my limited contact with them.

Outside the United States there isn't — one of the interesting things in the history of PGP is within about a day of the time Version 1.0 was released PGP got outside the country. The U.S. Government treats strong encryption products as basically being new munitions; basically cryptography is treated the same way as a tank, a bomb or an aircraft. And the way it's applied isn't always rational, but the laws do get enforced.

One of Phil Zimmerman's big problems right now is that he is currently under investigation for violating these export restrictions, because he handed the program to a friend and the friend distributed it on the Internet. Each of the versions since 1.0 has also become distributed pretty much worldwide, because it is pretty easy to circumvent these distribution restrictions that are being put on [users] by MIT. And I don't want to imply that MIT is being lax somehow in doing this; they're not. They're following very much to the letter of what they need to do. It's that people are circumventing that.

But the International PGP Home Page is <http://www.ifi.uio.no/~staalesc/pgp/home.html>. The "N-O" is for Norway. PGP is kind of suffering from a profusion of versions; the commercial version, the international version, and the U.S. version all have slightly different version numbers. However, the version numbers that are up here and are listed on your resource sheet are the current versions. Even though they don't have the same number they all have similar functionality. The International PGP version uses the original versions of RSA that were used in versions 2.3. There are some advantages as far as that being a little bit faster, and

also it doesn't have some of the restrictions on it as far as the RSA patents don't apply outside of the United States.

M: You may want to point out...

Braddlee: Please do.

M: That some countries do not allow you to bring [inaudible] into their country.

Braddlee: That's right, including France, Iran and Iraq. There's a list, actually; if you go to the International PGP Home Page there's a link off of that Page that goes to a French site that lists the countries other than the United States that have restrictions. One of the things I thought that was interesting was that in May of this year the Russian government outlawed all encryption products that are not licensed by the Russian government.

And it's interesting that as far as the public policy perspective, the United States is actually heading pretty much in the same direction as Russia, Iran, Iraq, and other sort of well-known democracies as far as a model for encryption policy.

Okay. What is PGP available for? It is basically available for most anything you would probably want to use it on. I'm going to assume that most of you folks are going to use it on DOS, Windows, or on a Mac. It was originally written for DOS. The beginning, I think, was the Version 2.3, and there's been a port to Macintosh which has been okayed. It's obviously not a Mac application, but it does work and it works fairly well; the pull-down menus are reasonably complete and it gives decent context-sensitive help.

In Version 3.0, which is upcoming for both the DOS and the Windows versions, PGP is going to be rewritten more for graphical user interface. Right now PGP is essentially a command-line utility; if you love UNIX you'll like PGP. But the two URLs that I've listed up there, for WINPGP, the HTTP is zan.firstnet.net/~cwguidegeib/, that's the location for WINPGP, which is a shareware utility that will work under Windows for encryption, decryption, creating keys and most of the basic things you want to do.

M: [inaudible]

Braddlee: No. But it's listed right on the top of the Page. I think it's 2.1, but I'm kind of guessing. Yes?

M: What is the key length [inaudible]?

Braddlee: The key length?

M: Yes. Is it [inaudible]?

Braddlee: Okay. For PGP the current version will support up to 1,040 — I'm sorry, 2,048-bit keys. Yeah, bit keys.

M: [inaudible]

Braddlee: My understanding is that basically PGP in any of its forms cannot be exported.

M: [inaudible]

Braddlee: In any of its forms. Because it uses RSA, and — because it uses RSA, basically.

M: Then why [inaudible] claim that they [inaudible]?

Braddlee: Because they're using, I believe, a 40-bit key.

M: A 40-bit key?

Braddlee: Yeah.

M: What, what is the limit?

Braddlee: I don't honestly know right off the top of my head, but I'd be happy to find out for you. Yes?

M: [inaudible]

Braddlee: That's right, that's my recollection. I would assume that forty is what Netscape is using and exporting. I'm assuming that they're going to use the maximum that's available to them.

As you probably know, the 40-bit Netscape key has been broken. A gentleman in France did that in the last month or two. It basically took eight computers and giving a supercomputer a couple of days to hack away on it, but it is breakable. That's one of the reasons that PGP is restricted; it's difficult to factor the keys of these large lengths. The larger a key gets — it's not simply a gradual progression; the larger the key, the more difficult it's going to become to systematically break the key. MacPGP has tools for Eudora, which uses AppleScript, and allows it to basically encrypt and decrypt messages from next to the Finder Menu. It's also available for pretty much any flavor of UNIX that you would imagine, and Amiga and Atari, and I'm sure some other folks.

Okay. How do you use it? First you install PGP. For both the DOS and for the Mac versions, this is a pretty straightforward process. It's basically a ZIP or a StuffIt compressed file that you unpack, and it will install itself in the correct directories. I would strongly suggest, although you have it available other places and you can find it other places on the Net, that you go ahead get it from MIT.

You'll want to create a public/private key pair, and I would suggest you use the 1,024-bit key length. It's kind of the balance between something that is highly unlikely that anyone is going to break in the reasonably foreseeable future and having to wait an excessively long time for your files to be encrypted. The larger your key, the longer that takes. 1,024 is kind of the balance at this point.

Get your friends to use the same thing. Public key cryptography only works if groups of people use it, people that you interact with and communicate with, your business partners, whomever. Get other people to do the same thing.

You need to exchange your public keys. There are a number of ways to do this, and one of the easiest is if you have "The Finger." The Finger is a protocol that is available to you, and put it into your plan file. For example, if you Finger my UNIX account, which is braddlee@trapeze.scs.unr.edu, you will find my public key there. Feel free to use it and exchange public key rings. If you have a listing of public keys from your friends there is no

reason why you can't exchange those public keys. That's the idea behind them, that they are distributable.

There are local, regional, and international key servers. One interesting development on that is in addition to the public key server that's listed under the primary WWW resources on the hand-out, there is now a new domain — which I believe is pgp.org or pgp.net — which is going into effect to do international regionalized distribution of the keys. It's going to provide a better, more organized system for distributing your public keys, and also for revoking them.

[Tape change]

Braddlee: If you have a public key out, and it's been compromised, how do you get that information out to people that the key has been compromised, and not to use it anymore?

M: What was that again?

Braddlee: It's www.pgp.org, and I believe it's ".net." If it's not ".net" it's ".org," and I apologize for not knowing that. What I'll do is I'm going to update this list as soon as I get back into town, and I will put that in the pointer on here.

Key fingerprints on business cards. If you plan to use PGP or Viacrypt PGP on a regular basis then put the fingerprint — a small string of digits about 20 characters long and a perfectly reasonable size — put it on a business card. That way when you hand your business card out to someone they can get your public key off of a server, and they can check the fingerprint on that key off the server with a fingerprint on your business card. It makes it a lot easier to identify whether that's a valid public key. Yes, over in the corner?

M: Are those [inaudible] for PGP only, or do they work for any public [inaudible]?

Braddlee: As far as I know they're for PGP only. There is a [inaudible] key server that's run out of Michigan State, if you're using [inaudible]. And I think there are a couple of other distributors across the Net, but these are primarily PGP servers.

M: [inaudible]

Braddlee: That fingerprint is basically a digest of your public key. It's basically similar to a checksum. It's a small digest of what the public key is.

M: So you register with the key server, and then they [inaudible]?

Braddlee: No. You do the fingerprint yourself, within PGP.

M: Okay.

Braddlee: Use the PGP add-ons like Private Idaho, which is Windows e-mail using PGP; the WINPGP tool, and the AppleScript and Eudora tools. They have gone a long way towards making this usable. A year ago the only people that I really felt that I could recommend this to, as far as a real sort of everyday kind of thing, was people who really had a need for it, who were exchanging data that needed to be secure on a regular basis. The PGP add-ons and the new version of PGP, 3.0, I think will go a long way towards making this a tool that everybody

can use. Simply select the right pull-down menu, select "Encrypt," type in their pass-phrase, "Decrypt," type in their pass-phrase, sign, etc.

[You can] basically send secure e-mail. Use it. It doesn't do a whole lot of good sitting on your hard drive; make it a practice to start sending secure e-mail. And use digital signatures. I haven't talked a lot about digital signatures so far, but I'm going to do this a little bit in just a second.

And this is my public key. Any of you who have photographic memories will want to jot this down. That's what my public key looks like. So if you finger my account at trapeze.sc.unr.edu, that's what you're going to see at the bottom of my plan file. And you can see it was done with Version 2.6, and basically it's a field. It has a public key block begin, public key block end, and then the key itself is defined in sign. Right down here, the last line there, the [OMIO], that's a checksum just to make sure that the key itself hasn't gotten mutilated in transit.

M: [inaudible]

Braddlee: That's a 1,024.

M: Does that mean that, that gives you the [inaudible]?

Braddlee: Okay, so what you're saying is that if someone has cracked one key they've cracked every key. No. First of all, it's really, really, really unlikely that the gentleman in France is going to have access to — basically, right now at this point in time, I believe it is accurate to say that for a 1,024-bit key it is just completely impractical to do a brute force attack on a 1,024 bit key in RSA. There just is not the computing power available, even to the NSA or to anybody else.

Now, that doesn't mean that there couldn't be a weakness that we in the general public don't know about, but the NSA might be aware of or that somebody else has found out. But one of the things that I like about PGP, and one of things that makes me feel fairly comfortable with it even though I'm not a cryptographer, is that it is published. The source code is available and the algorithms that are being used are basically the best available tools that are available to the general public. It was not developed out of the NSA.

As far as I can see, based on how I've been looking at this for the last several years there's no way that you can have 100% confidence that any of these tools are going to make you completely safe. And a lot of the safety, a lot of the risks — and we're going to talk about that in a minute — come not so much from the encryption but from how it's used. There are a lot easier ways to get a somebody's information than a brute force attack on a key.

M: But did that person in France, [inaudible]?

Braddlee: No. In other words, if that message that he had was a credit card number, he's gotten that one credit card number after eight days. Okay?

This is a PGP encryption, a PGP signed document. This is a really small PGP signed document, and it has a field that begins the message, the text of the message, and then the PGP signature.

Now, what you can see here is that I have left the message itself in clear text. I haven't encrypted the message, all I've done here is sign it. So what I'm doing here is I have used my secret key and my pass-phrase to sign the document and say that I, Braddlee, am truly the person that created this document at a particular point in time.

This is a tool that you can use also for exchanging information and agreements, and that's one of the most important things that it can be used for — to certify if you're saying something, that it really is you that's saying it. Or if you're entering an agreement with somebody, it certifies that it really is the person that you're entering an agreement with. There is starting to be some acceptance of this as being legally valid signatures. Utah is setting up some procedures for using digital signatures, and there's a lot of other talk, too. There's what's known as the DSS, the "digital signature standard" that is being put forward as a federal proposal, and a couple of other things.

Yes?

M: If you sent me that [inaudible], how would I validate it?

Braddlee: Okay. You would validate that with my public key.

M: Oh, with your public key?

Braddlee: Right.

M: [inaudible]

Braddlee: Exactly. I would — how would I validate this? You would validate it as a recipient, you would validate it with my public key.

M: The whole message could have been encrypted, though?

Braddlee: And that's what it would be like if we encrypted the whole thing.

M: Should I separate the two, and [inaudible]?

Braddlee: No. Let me back up there for a second... The question is, can you forge this? Can you forge this signed document? No. Because what happens is PGP looks at the document itself, and the contents of the document are used as the basis for the signature. If you try to graft another message onto a different signature it won't process; it will come back as an invalid signature.

M: [Inaudible] secret and public [inaudible]?

Braddlee: Yes, it's 1,024 bit. Yes?

M: What is [inaudible] size of a file [inaudible]?

Braddlee: Oh, good question. What does PGP do to the size of the document? Actually, what happens is that PGP, when it compresses and when it encrypts the document, the first thing it does is it compresses it using the ZIP compression algorithm. Same tools, basically, as, as PKZIP. So it compresses it before it encrypts it. However, what I've done in these is taken that binary compressed information and "ASCII-fied" it, turned it into standard text, A-through-Z, I-through-10, standard punctuation characters. The process of doing that changes the bit-length of each of the characters, so it expands out by about a third. But anyway, what you end up with when you take a text document and you encrypt it using PGP — even if you turn it back into

ASCII so that you can send it through e-mail, because most e-mail systems don't deal with non-text characters — you're still going to have smaller document.

M: I thought I'd just make a point.

Braddlee: Please.

M: [inaudible]

Braddlee: That's true.

M: [Inaudible] allow it to be a constant thing [inaudible].

Braddlee: Exactly. What the gentleman was saying was that one of the things that PGP does, and it is a good idea, is that using the ZIP compression to compress the file before it's encrypted isn't just a case of efficiency in sending the file. What it does is it removes the redundancies that people can use to try to guess the contents of information, so basically it scrambles the file to a certain extent. It removes redundancies by compressing it, and then the encryption makes it even more secure.

M: [inaudible]

Braddlee: Well, remember that PGP isn't e-mail software itself. So usually what you're going to do is you're going to encrypt a file and then you're going to send it as an attachment.

Okay, so that we don't run out of time, I'm going to try to move on.

[What are] some of the risks of using PGP? It is a poor idea to use PGP on publicly accessible computers. That means, for example, that we would not install PGP on our primary UNIX host at the university, even though we would like to, because you don't want to transmit unencrypted pass-phrases over a network. You really don't want to leave people's secret keys out, even though the secret key isn't much good without a pass-phrase. It's just not a good idea. In fact, it's not a great idea to even use PGP on a computer that's attached to a network. It really depends; a lot of these things are things that you're going to have to look at in the context of your own environment. How secure does my information need to be? Try to take your risks from an informed perspective. You're probably not going to be able to eliminate every risk in the universe.

The question is, can you understand what those risks are and take them from an informed perspective? I would not use PGP on a multi-user UNIX system. I would not use PGP if I had to log onto a computer over a network.

[I want to mention] compromised keys and pass-phrases. If someone knows your pass-phrase to your secret key then they can sign documents as you, and then they can decrypt your messages. Basically, they have access to the whole tamale.

Forged keys — we talked a little bit about that earlier.

People being able to spoof who they are to you. There are things like "Man in the Middle," and there are a number of ways to do this.

Traffic analysis. You don't necessarily have to know a whole lot about what people are saying to each other; just the mere fact that they are talking to one another can be useful information. If I'm sending a lot of mail to Bill Gates at Microsoft, that's probably going to tell you more than if I'm sending mail to Mary Jane at portland.edu or something.

Un erased files. If you're smart you will use PGP, you will use a RAM disk, you will not write on your hard disk and you will have to watch out for Windows swap files. You have to watch out for files left behind on a disk. If your original is left behind on a disk and is on a computer that is not secure, which is easier, doing a massive cryptographic attack against a message or getting into somebody's office and using Norton on their hard drive?

Viruses. It's theoretically possible that a Trojan Horse or a virus could be created that would capture your pass-phrase as you typed it in.

"Tempest attacks." this is a little obscure, but it depends on how you like to live your life. It is possible to monitor the electromagnetic fields coming off of computers; you can sit in a van across the street from someone's house and monitor what the keystrokes are. You can shield against that. This is a question of: is it a risk? Do you think it's really a risk that you're subject to?

Bogus time stamps on signatures. Just because something is signed at a particular time doesn't necessarily mean that it was really signed at that time. I mean, I can go in and change the time on the CPU, and it has a bogus time stamp. One way to avoid that is to use a trusted third party to certify that the times and agreements exchanged with digital signatures are accurate.

And again, notice that I put this at the bottom, "Crypt Analysis," which is brute force and other attacks against the PGP key, against the RSA keys.

How do you get help with PGP? Read the manual. Phil Zimmerman has done a very good job of writing the documentation for PGP. It is also available as a book from MIT Press, *PGP Users Guide*. It is about \$14, if I remember correctly. There is now some other good documentation and books coming out; on the last two pages of the handout I list those. If you need help and you're a commercial user, or if you're a non-commercial user and you're still struggling, get a supported version that will give you somebody that you can call. That may be worth the \$100 or \$150 for you.

The UseNet newsgroup alt.security.pgp is a good place to look for information. They are not the first place that I would post a message that says something like, "How do I create a public key pair?" I would use that more for reading, or for more advanced questions. Read the FAQ files that go with both of those newsgroups.

There's a list of other newsgroups and mailing lists. The list of pointers to EPIC, the Electronic Privacy Information Center, on the third page of the hand-out has a good list of those things. If you really, truly think you found a bug, and it's not just that you're having trouble with something, send e-mail to pgpbugs@mit.edu.

And lastly, don't bug Phil; really use all of these other things first. And then, only then, if you really think you know what you're doing and you haven't been able to find a solution to the problem, then you may want to try to get in touch with Phil Zimmerman directly.

Okay. Is PGP legal? We've talked a little bit about this. If you're a commercial user you need to get Viacrypt's version. The RSA libraries are not licensed on the MIT version for commercial use. Versions 2.3a and below are in violation of the RSA patent rights; Versions 2.6 and above are not. So as long as you're using 2.6 and above, and you're using it for non-commercial use, go ahead and use the MIT distribution.

Do not take PGP on your hard drive out of the U.S. or Canada — it is a felony. You are exporting munitions. And frankly, I would not want to be the test case on this.

However, it is okay to send encrypted e-mail internationally and it is okay to use digital signatures on stuff that is going overseas. It is okay to send encrypted messages overseas. The U.S. versions and the international version of PGP do interact, they are interoperable, so you don't have any interoperability problems between U.S. users of PGP and international users of PGP.

There are also some alternatives to PGP that you may want to look at if you've decided for some reason that this is not appropriate for you. There's the Privacy-Enhanced Mail Standard, which is not software but an Internet standard, an IATF standard. Software that is written to that standard uses different key management. There may be indications where it's appropriate for you. A couple of years ago I looked at [inaudible] because we were concerned about RSA and the licensing for RSA. At this point the number of people using PGP completely overwhelms the number of people using [inaudible]. For digital signatures you may want to take a look at the digital signature standard which is coming out.

Is PGP secure? That's kind of a difficult question. [Bruce Schneier] in *Applied Cryptography*, which is a very well-respected text on encryption and encryption systems, says that PGP is well-designed and nicely coded in the public domain, the closest you're likely to get to military-grade encryption. But what I'm going to add to that is that your privacy is secure only if you're using PGP properly, and if you can reduce the other risks. In other words you can use PGP, but if other people know your pass-phrase or can read your hard drive it doesn't matter how secure it is, because you've compromised your own privacy.

Phil Zimmerman is currently under investigation for a felony by the U.S. government for the export of the original version of PGP. He has accumulated thousands of dollars in legal fees and is basically fairly heavily into debt, even though most of his attorneys are working pro bono. He does have a legal defense fund, and there is a listing of contact information on how to get in touch with his attorney in charge of the legal defense fund. If you want to make a check out to them, it's the Zimmerman Legal Defense Fund, and you send it to [Phillippe Debois], Esquire, 2305 Broadway, Boulder, Colorado, 80304.

And there's also the Web site down there, <http://www.netresponse.com.zldf>. Something that I would like to do is — I'm not really being paid for this presentation. This is something I volunteered to do, but I'm going to be contributing a portion of my speaker's fee for a presentation I'm doing Wednesday to the legal defense fund. If anybody would care to contribute feel free to come up afterwards and toss in your nickel or dime or your lunch per diem right in there, and I will be happy to send it forward as a certified check.

Okay; [what's the] future of PGP? There are a couple of neat things going on: PGP Phone, which is secured telephony. MIT — actually, I'll tell you what. Can I hand that to you, and you pass that around? Thank you. PGP Phone is secured telephony. There is now a new version that has just been released in data from Web MIT to you network PGP Phone, and it will work over a modem at this point. There is an Internet option coming up, and this is a very neat tool. I would suggest that if you're interested in this then go, get a copy and take a look at it. It works right now, basically, on Mac, on Macintoshes only; but there is going to be a Windows version coming out in the next couple of months. It's a very interesting tool to have secure private telephone conversations. It has an interesting system of key exchange, and authentication based on voice recognition and encryption.

PGP 3.0 is coming up, and it's going to have much better GUI support. It's going to work much better on Windows and on Macs. It will have, rather than one secret key, two secret keys — one for signatures and one for files. There are reasons for this. For example, if you are required to give up your secret key for encryption files as a result of a subpoena your key for signatures would not be compromised. That's one reason for having two keys.

There is a possibility it will have support for encryption standards other than RSA and IDEA as options. And it's also a possibility that it will have some options for interpersonal key escrow, where you can give two friends half of your public key so that you can retrieve it later if you need to.

Okay, thank you very much. We're a little bit over time, but I'll be happy to stay down here and answer questions for you. I appreciate your attention. Thank you and have a good afternoon.

PUBLIC RELATIONS THE INTERNET AS A PUBLIC RELATIONS TOOL



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President/Owner, Alexander Communications

Tanya Mazarowski: Welcome everyone. This is the Public Relations in the Internet Seminar and we're going to go ahead and get started. We're going to have some technical people working up here, but I don't think they'll be too distracting.

When we were designing this PR track session, we had several things in mind. We knew we didn't want a bunch of editors up here telling you, "Well, I don't want to get faxes, but e-mail is okay." And "I'll never read my mail," and "I'll throw out everything fax that comes through the machine, but if you send me a FedEx I might open it." So when Nancy Nelson and Pat Lane at Meckler came to me and said, "Well, what, how do we use the Internet for PR? How can somebody use this new medium?" We had to think about who we knew in the PR field who really understand the value of the new medium and could take their time to share their expertise with all of you today.

Each of the speakers we have here today have taught valuable lessons in PR, and were specifically hi-tech PR in dealing with the Internet, the Net community and the network itself. The Internet community compiles not only print journalists, but your direct consumer.

Unfortunately, our first panelist, Brian Johnson, was unable to be here due to the last moment personal emergency, but we're fortunate enough to have JONA Group here, as well as Pam Alexander, President of Alexander Communications, to share some of their insights with you. We first have the JONA Group. They're going to be talking quite a bit about their extensive experience in the Internet field.

Last spring I spent a few weeks on the west coast in a General Meckler Press Tour. As our offices are located in Westport, Connecticut, of course, the hi-tech Mecca of the east coast, and we realized after the tour, how essential it was for us to be able to tap into the Bay Area resources, and have someone on the west coast with an ear out for our publicity interests.

The newly formed JONA Group, comprised of seasoned professionals with hi-tech backgrounds was perfect to suit our needs. JONA organized and executed the recruitment of media and analysts for this year's Fall Internet '95 Show. We've only, we've heard only good things about the quality the press registered for this event from our exhibitors, but, and the press, well, let's just say a well-known hi-tech journalist from the Wall Street Journal received a hundred and fifty phone calls on Friday, but still showed up here in Boston ready to cover our show. Yeah, the JONA Group is working with us, and they're doing very well, not only for Mecklermedia, for a variety of Internet clients, including BBN (Planet), E-Ticket, GO Net, Open Text and Harlequin.

Please welcome Jamie O'Donnell and Nola Armijo.

Jamie O'Donnell: Thanks Tanya. Is the, is the volume in this microphone good? No problems?

M: Louder.

Jamie O'Donnell: Louder? Okay. Can you bring that up a little bit volume-wise? Is that good?

M: [inaudible]

Jamie O'Donnell: Okay. How's that?

M: Louder.

Jamie O'Donnell: Okay. We're going to do this and see how this holds.

M: That's better.

Jamie O'Donnell: Better? Okay. We'll try to keep one hand real stationary. When Tanya asked us as we were getting ready for this show this, this October, and I'm really, really amazed having been in the PC industry for about fifteen years, and to have, to sort of see the whole PC revolution happen in the early 80's, and then the watching the Macintosh shows in the mid-80's sort of, you know, take flight and grow with great, great excitement, to see it for a third time in sort of my career in technology, a lot of excitement and a lot of enthusiasm.

When Jarrett Saburg was asking me yesterday what, what I thought was the most interesting thing about the show, I think the most interesting thing is you can contrast all the money that's been spent on the Windows 95 launch in 1995, both advertising and public relations, and all different types of marketing vehicles, right down to the Rolling Stone, and take a look at what's happening on the floor down here, at the grass roots developer level and vendor level, and the excitement and the juice happening down on the floor, I think is, you know, that, that, that, third time around that I've seen in the industry that there's, there's a platform coming about with a great amount of excitement. And it's really tremendous to see down there. It's also a model that is very much emerging and only taking shape now, and it calls for some very, very, very high degree of adaptability to, to do promotions and marketing on the Internet.

And we had a choice to talk about two things. To talk about, you know, the formats of press materials on the Internet, who to contact and how that list is growing. And I made a decision to go another direction. And we can come back to some of those questions, is there are those type of questions there, sort of, you know, leading off. But I want to talk more about the phenomenon of the Internet, how it changes the model for public relations, and the process that we're working on day-to-day, and really test piloting. Because it's very, very much in an early adopter phase, where you've got to try things, test them out, see how they work, measure it and go back and test again.

So Jarrett, do you want to start on the slides over there? Okay. You can go right on to the next one.

Public Relations on the Internet. Well, it's certainly not a, a mature or static model yet. What you learn today about promoting content or services, changes almost every day. The, as we were getting the press registrations for Internet World and getting them into the database, there were new vehicles coming in every day that weren't at Internet World six months ago in San Jose.

You need to keep your peripheral vision open. There are new things cropping up on the left and the right every day. Things you need to go in and research. Sometimes they're not easy to research. Some of the hardest ones have been [getting] a lot of interest by Internet enthusiasts and some of the easiest that have been getting a lot of coverage, as well as some of the young Web enthusiasts, and I don't have to spend a lot of time on [them]. And it takes a lot of research to track down who's working on those, the editorial page and how to reach those people, and how to work with them is not clear yet at all. But there's a lot of interest with two or three of them from our experience.

You have to expect that some vehicles are going to become critical overnight. Others are going to become critical over time, and some of them are never going to hit the target. You know, we, we've seen new magazines from Meckler, we've seen new magazines from Newsweek, like Virtual City, we've new magazines from Ziff, *Internet Life*, that's being launched at the show here today. Some of those are obviously going to take hold and hit the target right on. Some of them are not going to, and the best you can do is test with those and pilot project with those.

If we take a look at two or three examples, I can, that I can think of in terms of examples of things that took out, took off with a lot of serendipity and a lot of test project along the way. You think of NetScape's distribution mechanism of providing the browser free from a download and you know, Meta Company, that's a market leader now in that segment, and wasn't shipping product last December. Open Text is a company that has a indexing engineer down on the floor here and we helped Parker Nichols on the west coast support that client, and Open Text got a lot of publicity once it had a deal with Yahoo, anything happening with Yahoo and Netscape, just draws publicity for other companies. And third, you take a look at the incredible amount of take-off coverage that's happening for things like Real Audio and m-Take Video and VRML in the last few months, that, you know, there was literally no coverage if you go into a database search six months ago.

Next slide, Jed.

And all this means, is that you have to sort of learn what state-of-the-art, experiment, test the limits. I think a couple good examples recently of testing elements and experimenting, you think of IBM's takeover of Lotus back this summer, and that Gerstner took his takeover letter to Manzi, put it up on the, on their Web page and on the Internet, made you know, their position clear for the world to see without violating any SEC rules, but sort of you know, change the model a bit about how you make public information available using the Net.

I don't do this every trip, but every couple of a trips I help myself to United Airline's magazine from the plane, where there's an article that I, that I have to read or I want to share it with somebody when I get off the plane, and I thought there was a very interesting about merchandising Web sites in the October issue, when they talked about the hot, hot, hot page. It's one I've seen a couple of times.

I don't spend a lot of time, but it's one that frequently pops up as I watch some of the younger people in our office surf, and they talk about testing and experimenting with the size of the icons, how graphically it's written, both for domestic audiences, as well as international audiences, how they measure user response to the page, in terms of buying patterns, as well as how they respond to it. A lot of good information about how a company takes a page, comes up with a concept, what's going to work for the user, tests it, and modifies the page regularly, as a result of the user feedback it gets.

Next page, Jed.

The Internet's many things. It's both a medium and it's also a distribution channel. We've had a couple of clients where, they've actually been using things like the Internet Shopping Network, Cybersource, a number of the on-line distribution mechanisms to sell products, and

some interesting things. When you think about Netscape, Netscape really developed as a company overnight by using the Internet as a distribution vehicle.

When you think back to a couple of years ago about in software and Doom and creating a cult game there, that was all done really with Internet pass-along, and e-mail pass-along of the product.

We're currently working with a Windows 95 help product that had to make a very, very hard decision about, they tried to go in two flanks and go on-line to distribute the product and try to do a retail product in the same time that Windows 95 was coming out, or do they only do one or the other. They chose the two dollar bet of trying on-line and what their research is showing them, it's a company called E Ticket that has a Quick Tutors '95 that they have licensed. It's available through AOL in the Windows 95 form. It's available in Prodigy in the same form. It's available in the Internet Shopping Network. And what they've found is that, and one of the founders of that company is a retail channel expert, so he's been tracking what's happening on the channel with the products, and there was a good six to ten products in the channel of a similar ilk, that are now going into the return phase, getting returned to the vendors, at a much lower price point. This particular client is getting downloads of about three thousand units a week through three different on-line forms. So very low cost and you know, building a market presence in that particular category.

This is not meant to wow a lot of people, but this just a subjective experience. And I'm not talking about some of the more consumer-oriented PC trades, and I'm not talking about some of the trades that are, Meckler trades and others that are, that are dedicated to on-line. I think one of the real challenges of doing on-line, public relations for on-line products, that there are traditional PC press that are not quick to embrace a changing model. As we have been promoting some products that are only delivered on-line, we're finding that there's often sort of puzzlement about new content categories. You know, where does this fit? You know, what are we going to do with it? It's, how are we going to review it? Because the models are very set about where products fit and how they get reviewed. There's often resistance to reviewing on-line products only. We've had some of the top-tier business-to-business computer trade saying, "If it's only going to be an on-line distribution, we're not ready to review the products that are coming up in that way." And you can, you can put together a press release, the documents, you know, AOL says we've got five thousand units coming down from our site in a week. We've got, you know, Prodigy says we've got, you know, four to five thousand, and in particular, press release saying, "How many units are selling?" And it's very, it's still a real challenge to, to sell downloads as a, as a barometer of product success.

What are some of the unique characteristics of this animal called the Internet right now and how has it changed public relations? It's a medium very much defined by speed. When I think about learning to do public relations with newspapers, you know, that model has been set for a long time. The same with magazines. TV is a, is a real long lead medium to work with in terms of placement. So you might work six, seven months on a placement, even in some of the computer-oriented programs. Same with radio. However, with the Internet, there's opportunities to try different things every day, revise your course weekly, get feedback fairly frequently.

With two of the clients we have in on-line products only market, every two weeks we take a look at what's happening with them in terms of their pages. What kind of response they're getting? Where is it coming from? And we adjust where we're going to go next based on that.

It's a technology defined phenomenon. We think of things going from cool new technology to early adopt your products to mass market products, and it's still very much in

that sort of technology category space. And as a result it's very volatile, and it changes a lot. And the user base right now is defined by high growth and dramatic change.

O'Reilly and Associates, who are one of the exhibitors on the floor, and I believe we have one of the research analysts sitting up here who worked on that, if you want to ask questions of her later, just completed a study of thirty thousand homes by looking at their press release in their kit. And you know, we're beginning to get a better focus on, on some of the sub-groups that we've not known much about. I mean, their study now shows that about 33% of the core Internet users are female, and that 36% of the commercial on-line services users are women. So there's data beginning to develop. They're saying, "How do you target women? What are they doing on the Net? How are they spending time? What are they interested in? And what are their information sources for the Internet?"

It's a product. No, it's a medium. Actually, it's both. It enables vendors to reach customers directly, and enables instant mass communications in some circumstances we've all seen. And as a result it creates new PR opportunities and it also creates real pitfalls.

If we take a look at the Intel Pentium chip example, and problems they had earlier in the year, they greatly underestimated the Internet and in e-mail as a vehicle to spread word about how the consumers really felt about the problem. And they weren't prepared for this as a new mass communications vehicle.

It also can create overnight hits for sites. I think of one, an alternative music site that several people in my office go to once or twice a week. And it was out of Santa Cruz, not there a year ago, and it's had phenomenal success, because it has appeal and the medium is right.

When you think about where we've been in the last ten years, and you think about communications models, if you go back to you know, Regis McKenna in the early 80's, he would talk about, you know, vendors would have a product, they'd encode a message, they'd go to the media to try the message out to see how it was received, the media would be conveyors to the end-user, and there would be feedback both from you know, PC Magazine and the media outlets, as well as from the users. And from there, vendors would, you know, hopefully tune their product plans based on feedback coming from two different directions.

With the Internet, I'm finding that it's greatly changing in terms of what a vendor has to consider in terms of the communications model.

What, what we see happening now, is if we have a vendor coming along and saying, "You know, who we going to go see on a press tour?" It's really a, a, a bi-directional situation from step one. What they really need to do, is they need to go out and they need to find customers to put their service or their content offering in front of, and get feedback from the customer right away and create a word-of-mouth campaign on whether they've got some hot contents or not, and then they need to go to media in this market as creating additional noise. But the role of the media here is, is, is in the process, is a really, really shifting from our experience of it. And if I told someone, you know, what their, what their main challenge was going to be in launching a product through the Internet over the first six months, I would say it would both be creating visibility for your company and your product concept, because there are new product and company concepts emerging as people go on-line completely, and convincing the market analysts and the press that you have a really interesting new model that's worth following. But at the same time you need to go to the customers directly with your content. And it's a, it really means sort of working two fronts at one time, compared to a more linear approach.

We, to give you an example about how the influencers are already changing, I think many of you probably remember the marketing Computers issue from the springtime, it was probably about the April issue where they did a, a rating of the computer trade press. Who's hot? Who's new and ascending? Who are the old guard that still have a lot of influence? And

when you look at that list, it was really looking at people who were reviewing PC products, whether they are business-to-business or whether they were consumer. But they were packaged products for the most part.

There was very, very, very little attention paid if any, to what's happening in terms of who the influencers are in the on-line market. And it, it, it, it's not always an easy one to peg.

And one of the things that we do in, in our office for our clients is, we have several people in the office who are on the Net every day. We're in San Francisco. They're friends with people who work at Hot Wired. They're friends with people who work at C-NET. They're friends with people who work with, who develop Web directories. And what we'll do on a Friday afternoon is we'll take a new content product that hasn't been launched yet, we'll invite everybody over for a glass of wine or martinis, and we'll say, okay, "Here's his content. What do you think about the tone of it? What do you think it needs to be successful, and where do you think it needs to get covered?"

And we recently did that about two weeks ago for a product that's going to be sort of in the murder mystery content category. And we sat down, a friend who works for Wired, Hot Wired, and a few of these vehicles, and we did a little, you know, "What ten places do you feel it has to go first?" As a way of coming up a map of where, where do we feel it needs to go. So we talk to the target audience, a small informal focus group.

And here's a list from 25 to 30 year-olds who are Web enthusiasts, about where they thought this product needed to be covered in order to get, to get attention from the target audience. They said, "Pathfinder." They said, "Hot Wired." They said, "Web Review." They said, "C Net On-line." The only paid one they mentioned was Mercury Center. They said, "Yahoo, What's New?" They said, "Computer Life." They said, "2 E Scenes, Urban Desires and Word." They said, "Buzz Net." And they said, "Gina Smith in all mediums." Now Gina is very well-known in the Bay Area between you know, her column in the Sunday Examiner, as well as her radio program. I'd be interested to see if we did that in other parts of the country. But Gina has quite a lot of say out in that marketplace. But you know, this, this list doesn't map at all to products pre-on-line content products. It wouldn't be the top ten list for even a consumer software product.

Now what does all this mean in terms of strategies for on-line PR? Well, the role of the influencer has mutated from product reviews to a media critic in our mind. And if you check out Cutting Edge, E-Scenes, you're really looking at sort of entertainment type reviews. If you examine the content of the Internet Life I was looking on the floor at yesterday, you're really getting into content entertainment-type reviews or information-type reviews.

So what does this mean for PR professionals? Well, the map, the process that we're following right now that we feel works best, given where the market is, and we may modify this, at a step, track step, but the model that we feel works well right now is first we take something that we're going to launch and we conduct these informal focus groups with Web enthusiasts, to get a sense of what's there, what's their reaction to it, what's the one in order to make the on-lined property as interesting as where it may live on TV or in print or somewhere else.

Then from there, we'll prioritize and segment the media, and we'll test everywhere cheap. We might start with the top ten list we had, then we might go to some of the top ten daily newspapers that all have what's new on the Net sections, then we might go to the syndicated PC radio programs. If you look at their media kits, all claim to have a high number of Internet enthusiasts listening to them, go to some of the computer syndicated TV programs. We segment the media and say, "Okay. How many of these make logically sense, and what's the order we want to approach these?"

Then we try to work with the vendor to map the press coverage to hits on the Web page. We do both on-line searches as well as hard copy clips in the office to say, "Okay. If we

got the *USA Today*, what's new, hard copy coverage on Friday, what did that do for the page over the next five days?" If we get covered in *Computer Life* in the issue at the stand on the, you know, 16th of the month, what did that do for hits to the page. So we really try to help the vendor understand, aside from our best guessing and our best sort of informal focus grouping, what hits are working for them.

We have a number of vendors that are talking to us about, as they're setting up their pages, they're getting ready to put vehicles in place to say we're going to ask the user when they come on, what led you here in the first place so we can begin to map the information sources issue better.

There's also the opportunity now, if you go down to the floor and you pick up the kits and the information from the people that are down on the floor, there's three or four that are, whether it's Data Quest or Writing Associates, there are three or four research oriented firms that are coming out with substantial studies now about you know, who is the user, what are they doing, how are they changing, where do they spend their time and what are their information sources. And the more of that you can do of that, I think the more you can feel confident about the model.

And last of all, I, I mentioned, I think it's you know, it's not a static picture at all. We know that's it's changing from month-to-month. I'm sure we're going to feel that you know, it's even changed greatly as we, if we convene in San Jose in March, and that as a result of that, you need to constantly be monitoring and reassessing who the customer is and the critical influencers, in order to reach those customers constantly. And you need to monitor what is happening and what is new on the Net constantly. And you need to take your public relations and view it as, as, as fluid as your Web page, and that the model needs to be evolved and changed and altered, as frequently as you probably have to alter your Web page to keep it interesting and keep it up-to-date.

I think Nola wants to just spend a minute putting a couple of slides up to give an example of what kind of interest is happening with some very consumer-oriented comment.

And Nola, did you want to do that from up there?

Nola Armijo: No, I have my [inaudible].

Jamie O'Donnell: Okay.

Nola Armijo: You're okay. Well, Jamie mentioned one of our clients is E Ticket. And E Ticket's a...That's page two Jed. E Ticket's a combination of a Web page and CD-ROM company. And they came to us just like two weeks before the Miss America Pageant and said, "We're going to put up a Web page for Miss America. We have the rights to you know, all the information from the past seventy-five years. We can put up photographs, contestants this year," which they did in fact do. And eventually, they're going to use it as an outreach effort really to give young women information who want to participate in pageants. Well, how, what they need to do in their local states in order to get connected and learn more about how to participate in beauty pageant.

Well, this was, of course, as you might imagine quite, quite a challenge because, you know, it was great because we had Miss America coming up in a week, but where were we going to, how were we going to try to trigger some interest in a Web page? So naturally, we did the obvious things. We did a press release and we sent it out to 150 print sites and broadcast Web sites. And we also got the Miss America Organization to distribute the information at the event, and then we, we, we've put together a very highly-targeted list of about twenty or thirty national publications, national daily papers that list Web sites on some

basis, once or twice a week, and we were able to get placements in very high profile papers, because this was kind of an interesting novelty. We also got something in Reuter's and of course, Gina Smith and On-line Today.

Now what do you do after that? I mean, they're only going to carry your information once. So, and to me, this is the most interesting, one of the most interesting things about the on-line world, because it's, it's really, it's as much a consumer medium as anything else. I mean, people gather at places of interest to them. And so the next thing you have to do really, is to find places on the Web that might be interested in Miss America, where there's a common interest about beauty and fashion, and then the next thing would be to go to print publications that list Web pages. And we're working on some of these longer lead publications now. If E Ticket's expecting to come out with a CD-ROM with all the Miss America information, at the end of this year.

Are there any questions?

M: The two points you want to make out of this case study was one that as you re-prioritize media, you have on-line vehicles. Really the publicizing in on-line, and the on-line opportunities are jumping to the top of the list, because they're more immediate and they're more quick. And then going to the more traditional print vehicles, come second or third, and the broadcast vehicles come, you know, coming into second. So it's kind of flipped over from, from what it was in the PC products medium.

The other interesting thing we're learning in promoting on-line pages or on-line properties, Web pages, is that the reporters out there, A, want to get onto the page before it's actually launched, and they want someone to be able to take them through their page in about five to ten minutes flat. If you're the Reuter's reporter or the USA Today reporter, you want, you know, you want to be able to go in and look yourself, then you want somebody to talk through what they want to tell you about it in about five minutes flat. And for most clients, that means getting used to having a demo script for an on-line page. That's sort of a new animal for them saying, "In five minutes we've got to get through. What are the highlights we want to show them and our philosophy about the page." This was a good example of that.

Nola Armijo: There's a man over there. Over here. There's a man over there.

Jamie O'Donnell: Do you want to take a question now or do you want to continue?

Tanya Mazarowski: We're going to continue with one more, our last panelist and then we'll open it up to questions. Oh. We've got with us, we're lucky to have with us Pam Alexander. She's the president of Alexander Communications with offices in San Francisco and Atlanta. And she's here to talk about some of the hot public relation sites on the Internet. Are we surfing? We're surfing?

Pam Alexander: Well, no. That part of it isn't going to work so what I can do though is show you guys some sites you might want to look at from there. Yeah, I think it's...First before I start in this...

What about now? Is this better? I'd just like to get a sense of who you all are. And if you could maybe raise your hands if your primary job is PR either in your company or with an agency. So it's maybe a third of you. And for those of you, whether you do PR primarily or not, how many of you have Web sites where you are trying to reach the media, whether it's market analysts or journalists? Okay. So maybe when we get to the Q & A part of this, you could talk to us about some of your success stories, what's working well for you. And I can seem to go

over there, but I'll just run through these slides really quickly. We were hoping to be able to get up on using actually CompuServe's brand mosaic to launch us into the Internet and look at some sites that I think are of interest. And some of these companies might actually be in the audience.

But Ventana is one. They've got, and some of you may have seen it, they have a press club. Novell has got a multi-lingual international Web sites for journalists, so that people around the world can access what they're doing and they're press releases and every language that they ship product in. So I'll try to give you a list at the end and you might want to check it out, because you could appropriate some of those things that might make sense for your company. I know all the lists, whether it's *Yahoo* or *Lycos* or whatever, have some good sites listed. And actually, I just heard from somebody today that Ketchum has a really good site, Ketchum Public Relations. I haven't seen that, but I understand it's really good.

So just whipping through this pretty quickly. A little background on us before we get into these facts and figures, we've been doing hi-tech PR for over eight years, and we're based in Atlanta and San Francisco, and we have an office in London that's very small. But the Internet and on-line has made that possible. And working with people like CompuServe, we've been able to link all of our staff that way, and communicate with journalists and have, as long as we've been in business via e-mail.

That might be one of the questions to ask all of you, if, raise your hand if you are currently communicating or have for some time with journalists via e-mail? So, okay, I think a lot of us, you know, in addition to all the points that Jamie and Nola made, we might see the Internet as really an extension of what we've all been doing who've been on e-mail, communicating with a target audience of journalists and market analysts, and now that interactivity is probably more enhanced.

But this is just a little bit of background that, I know this a week full of research about the impact in the Internet, and this next slide Tanya might be able to update, is the latest number of subscribers, 208,000?

Tanya Mazarowski: 265.

Pam Alexander: See, it's probably growing by the minute. So, I think we're all used to this. And this is the environment that we're making our decisions about in terms of applying the medium to what we do in PR. The example that Jamie used about Intel, I think we all remember from almost a year ago when they were caught by surprise. And the, the principle that we've all learned, which is if you don't tell your story yourself, other people will tell it for you. The Internet, I think we've all seen, facilitates that more than anything else. But the speed with which the communication gets out and the fact that the data is there and easily appropriated so that people can, can run with that. And I guess, when I say "people", I'm talking about journalists. One good quote that I saw from John Markoff at the New York Times recently was "I used to feel like the used Nets and some mailing lists were my own private backyard. In the mid-80's, I would get a story a week from Comp.Risks, but now there's, if there's something good, dozens of people see it."

So I think maybe we're feeling like we're all trying to compete in this new medium to, you know, either draw attention to a Web site and what you have to say. But I think journalists are also finding that they're, or at least those that were kind of ahead of the curve where they would be able to go to sources and get information that, that now they have to sort of dig deeper. And so I think we'll all be working on this together to find the best ways to both disseminate information and find the best sources for information. And I think that kind of sums up that page. I've only got six or seven more slides.

But what I was going to do is going into the Web sites of these three companies. I mentioned Novell. They've got a multi-lingual site. And HP, gee, that slide is sort of in process. Theirs has got all their press information updated constantly. I think a lot of you had said, seen, what digital has been able to do, not just with PR, but in selling product via the Net. And we'll just change that. This is new program for me. Anyway the Novell Global Reach. I think the emerging technologies that we're going to see on the Internet, real-time video and audio and this show is one where we can walk out on the floor and see that happening, and the collaborative environments. So there they are.

I've just pulled some of them down. CompuServe's home page. I know Russ Robinson will be up here in a minute to talk about what he's doing from within the corporation. If you haven't checked out, OOPS, well, I'll be able to get through this. Meckler's home page, you know, the I-World that's specifically pulled together for this show. You know, Yahoo and the other directories. If your company isn't listed on every directed you should be listed on, that's one important first step to take. Again, Ventana, the let's see, well, let's cross our fingers.

Tanya Mazarowski: Stop. Stop.

Pam Alexander: Oh, well, it will be okay. The, okay, well, all right. OOPS. Sorry. Okay. The, okay, well, I'll just get out of this and we'll just go off-line, because I don't have my battery with me. I'm sorry you guys. Okay. Tanya, can I [inaudible].

Tanya Mazarowski: Does anyone have any questions for our panelists? I think we had someone right over here.

M: When the speaker talked about the [inaudible] print media on the Internet, I wondered if you would have any metrics on how print media, [inaudible] needs to get to [inaudible]?

Pam Alexander: No, I don't. I mean, the real answer is I don't have any real information. But I do think that when you have something that is as highly focused and targeted as something like Miss America, and it's kind of unusual subject to find on the Internet, you have to go to print vehicles in order to drum up interest among people who would be interested in that kind of on-line information.

Tanya Mazarowski: I know we do have some information at Internet World. It's very easy for us to classify our readers, because we know all of our readers are most likely on the Internet. With a magazine like *Mirabella* or *Elle* or *Vogue*, it's a little trickier for them to do their reader surveys.

Jamie O'Donnell: We've been doing some placing in SPA sponsored [Cyber's Affair] contests over the last two weeks...

M: Would you mind using the microphone?

Jamie O'Donnell: Sure. Just another answer to that question. We've been doing some placement work for the SPA sponsored Cyber Safari contests over the last couple of weeks. And we had a long enough lead-time on that, that we managed to do placements in most of the major daily newspapers on-line versions, as well as print versions. And they are going to be tracking the, the, the coverage or the traffic that happens to the site, based on coverage from both mediums. So there's going to be some information coming out of there from SPA as to if

you take a look at all the on-line sites where it's promoted, as well as print, how did that stack up in terms of interest in the program. So experiments like that are in the works, and I think that you know, there's a number of them happening where there will be some information happening where there'll be some information coming out of that.

Tanya Mazarowski: Just two more questions, because I know we're running over into our break.

M: We've had experience which we, with the PR on the Internet [inaudible] on-line. And then when we approach the print media, they refuse to accept any, the articles that already appear on the Internet. We were told that if we wanted to, [inaudible] print media before, and accepted on the, [inaudible] they would accept it only if it came to them first, then we could put it on the [inaudible].

Pam Alexander: What kind of print media are you talking about? Like magazines, newspapers?

M: Talking about trade journals.

Pam Alexander: Oh, trade journals. Did...

Jamie O'Donnell: We're not having that experience at all with the Quick Tutors product, with the Windows 95 tutors product. It was on-line in a lot of places as the product launch, as most of the computer trades are now working on reviews as they do round-ups about various health products for '95.

M: We're not Microsoft.

Jamie O'Donnell: Right. We'll it's not a Microsoft product.

Pam Alexander: No.

Jamie O'Donnell: It's a small start-up company product. So, so we aren't, we haven't been coming across that particular issue as we, as we go to the print media second.

Pam Alexander: Jamie, one other point just to keep in mind, is just the whole timing of it. I mean, all the lead times. If you're dealing with a trade monthly, you might want to hold-off until you've given sort of advanced briefings if it's a new story to people, before you actually put it on your Web site, or do any sort of on-line issue. I mean, whether you're Microsoft or not, you might get less interest if they feel like they've been scooped by, you know, the dailies. So...

M: [inaudible] nobody on the on-line, the Internet [inaudible] to the print media.

Tanya Mazarowski: Another question?

M: A follow-up on that other one. [inaudible] is driving me crazy. [inaudible].

Pam Alexander: I think things are going to be technical. There are going to be vendors who are going to have directory services. I mean, we're really at the birth of all of this, and whether it's AT&T or whether it's Netscape, they're going to partner with people who can do directory

services so that they'll be in the intelligence, where you're not going to have to deal with the kinds of naming, schemes and conventions we deal with now. I mean, that's not going to be overnight, but in the meantime, we're going to have to limp along with that, I think, and just, and sorry I didn't get those names of the Web sites to you guys. I know, I can tell you Ventana's. It's vmedia.com. So but the others, just look up in Yahoo.

Tanya Mazarowski: I'm going to give you all a chance to talk to our panelists off-line kind of, and please enjoy your fifteen minute break, and then we'll come back for Russ Robinson with CompuServe.

PUBLIC RELATIONS A CORPORATE VIEW OF PUBLIC RELATIONS AND THE INTERNET



MODERATOR

Tanya Mazarowski
Public Relations Director, Mecklermedia

SPEAKER

Russ Robinson
Director of Public Relations, CompuServe, Inc.

Tanya Mazarowski: I crossed paths with Russ for the first time in Las Vegas for a Comdex event, and we became friends through a mutual appreciation of Willie Nelson and chili. He began his career as a radio announcer in South Carolina while he was a student at the University of South Carolina; from there he went to the Boston Bureau of the Associated Press where he was a broadcast writer and regional editor.

Lured by hi-tech writing and reporting, he moved to Florida in the early 70s where he became an aerospace reporter and editor for the Gannett *Today* newspaper near Kennedy Space Center. The *Today* newspaper is a prototype for the *USA Today* paper that we all know. Russ spent his stint in Florida's west coast as a political reporter for the *Tampa Tribune* before joining the *Baltimore Sun* in 1979, where he once again was drawn into the hi-tech world.

In 1984 he became a magazine editor for IBM in White Plains, New York. During his career at IBM he managed communications, community relations, press relations and publications in Manassas, Virginia, Gaithersburg, Maryland, and Triangle Park, North Carolina. Just before leaving IBM in 1994 he was Executive Communications Advisor to the General Manager of IBM's Networking Software Division.

Since joining CompuServe a year ago, he's seen his company almost double in size and his public relations staff quintuple in people — that's a five-fold increase in the size of the department. And if that's not enough to keep him busy, he rebuilds and rides motorcycles in his spare time. I introduce Russ Robinson.

Russ Robinson: Thank you, Tanya. Oh, well... Listen. I have no foils. I have no slides. I have no PowerPoint. If I can't hold you with what I have to say you're going to be bored anyway, and that's not going to do me any good; so I'm going to talk to you professional-to-professional. Now, I was here a little bit earlier, so I kind of have a pretty good sense of who you are. I'm going to move around a little bit while I talk, because that's just who I am.

Let's start with some basic assumptions. I assume that you know what the Internet is, that you know what the WorldWide Web is, and that you know what Home Pages are. If you don't know that, this is not the place to learn it. Well, I take that back; go downstairs, and you can learn an awful lot about it. But this seminar is not the place to learn it. You have to get the equipment. You have to get on-line. You have to spend the time and effort to learn what this medium is all about, and I cannot teach it to you in thirty minutes. Nobody can. You've got to learn it yourself.

It also assumes some degree of computer literacy. I can't imagine anyone in our business these days who doesn't use a computer, but I still run across them. I run across reporters writing about us who are using DOS machines from God-knows-when — 286 machines — so there still are a lot of people out there who are not really computer literate and who really aren't up to speed with the technology. You've got to get up to speed with the technology, and the best machine you can buy is the machine you should buy. The higher the modem speed, the better.

[Let me start by going over] some basic premises. Cyberspace is a new medium. I'm going to tell you some things that we've done, and the way I've arranged this is that I'm going to talk about ten things that we've actually done at CompuServe, and then I'm going to try to weave into that ten things that you shouldn't do because they're just going to get you in trouble. And this is the voice of experience speaking.

The Internet really is a loose network of thousands and thousands of servers and millions and millions of PCs; so what we have is a tremendous source of information out there, and a tremendous source of interactivity.

[I want to mention] usage figures. Who's out there? It depends on who you believe; the figures vary from five million to thirty million people, and the truth is probably somewhere in between. I know that at CompuServe we have almost four million members, and AOL has almost four million members, and Prodigy is sitting there at a million. That's close to ten million right there, so in my mind you know it's got to be a lot more than five million... But it is an emerging media.

Who are the people who are on-line? About 85% of them are in North America. That's good news for us, because most of us work in North America and most of our markets are in North America. That comes out of a Georgia Tech survey. Most users are males; their average age is about 35, they are professional, highly-educated, and their average income is about \$70,000. This is not a cross-section of middle America, but it's changing. It's changing every day.

The PC industry believes and hopes — and I do too — that they are getting ready to enter one of the largest Christmas seasons ever for the sale of PCs. And that's good for all of us, because — I forget how the ratio goes, but the value of the network increases geometrically according to the number of people who use it. One telephone is useless, two is twice as good; but [if you have] a thousand or a hundred thousand people on the telephone, then you have a network, then it becomes useful and then it's a real tool. So we are growing.

Seven to nine percent of the U.S. population is currently on-line. It's a tremendous market out there, and it's going to keep growing.

InterAd Monthly predicts that by the turn of the century on-line marketing will be a billion dollar business. I don't know how big it is right now, but it's big. It's foolish to ignore this tool, because it's a tremendously powerful tool. You don't think it's foolish? Do you remember a company called Intel? Okay. Remember how they had a little problem with the Pentium chip? That started at Lynchburg College. I'm sure it's a great college, but it's not exactly MIT. This professor, on a pretty innocuous bulletin board, posted a little problem he was having with his calculations, and it didn't take long for that to spread across the entire Internet. Intel at first tried to ignore it; but in the end, Andy Grove, the President of Intel, ended up issuing a public apology. They just misread it. [That shows how the Internet] is a tremendously powerful tool.

But it's totally unorganized; "global anarchy" is how you often hear it described. There's a loud voice to the silent majority, and it also gives us a loud voice.

The things that I'm going to tell you — if we look back three years from now, they'll probably look about as primitive as the vacuum tube, because this is an emerging medium and it's only limited by our imaginations. Now, remember one thing about the vacuum tube; it's big and it's bulky, but it worked. So these things that I'm going to tell you have worked for us, and hopefully you'll walk away with something that will work for you.

One — and there are ten of them, so you'll know when I'm getting near the end — through the Internet or an on-line service, you can communicate directly with your clients or consumers. It's a tremendous tool; no more mail, no more telephone calls. You write it down, and everyone understands. You can go on-line to do surveys of your clients. You give an e-mail address when you issue your products, and they can get back in-touch with you.

We recently did a promotion with radio stations where we were giving radio stations free accounts. And we said, "We'll give you a free account so that all of your listeners can reach you on e-mail, and all we want out of it is for you to mention that address five times during drive-time on every single day." When you stop and think about that, it sounds like nothing for them. But every time they're doing wsyx@compuserve.com, we get the CompuServe name mentioned. If you establish a WorldWide Web site, every time you give out that address you'll get your name mentioned. Mindshare — that's what it's all about.

We put Bob Massey's letter to customers or members on-line, on our WorldWide Web page, so that he can speak directly to them. And we build into that a feedback mechanism, so that they can speak directly to him. I've offered to answer those letters for him; he gets a lot of them. But he really does answer them personally, because it really gives him a feel for what people are thinking about our service out in the real world.

That brings us to point two, which is e-mail. E-mail, in my opinion, is the most powerful tool in cyberspace, and it's also the most dangerous. Now we've covered both points here.

I think Pam said earlier, "How many of you have been pitching to reporters on-line?" Well, I know we do it. But I also know that if all of us do it, none of us will be effective. You have to be very careful with e-mail.

In July we did a survey. We had 600 reporters we deal with on a regular basis on our list, and we sent out a survey to all of them, some of them on-line, if we knew their e-mail addresses, and some of them hard copy, and we said, "Okay, guys. We want to know two things. What information do you want, and how do you want to get it?" Basically, we were asking them for permission to use e-mail to send them stuff, because if you send people stuff without their permission on e-mail, you're creating a problem for them and they're not going to appreciate it. And it's very easy to very quickly alienate a reporter doing that.

I'm going to tell you the truth. I get 120 e-mail messages a day, and with about a third of those I see who they're from and I hit that "delete" button. They're gone. You don't want to be one of the people that happens to.

So you have to use e-mail very judiciously. You have to write tight, and you don't send all the information the first time. It's just got to be a quick note that says, "Mr. Sandburg, are you interested in a story on XYZ? If so, hit the reply button and tell me you want the release, or that you want a letter from Bob Massey, my CEO, and he'll tell you about it." [You want to write] little things, quick notes just get their attention. If he says, "No," move onto the next person on your list. If you're trying to sell an exclusive, you can do a wide area distribution if you want to, but we have found that what e-mail allows us to do is target things. That's another one of its strengths, that you can target things. If this guy says, "No," it is very easy for us to redo that e-mail note and redo that material and send it out to the next person on the list.

Today we are issuing fewer news releases at CompuServe, but I hope that you guys are seeing more news stories about us. That's because we're targeting. Part of that survey allowed us to break down the different things that we do into areas in which journalists would be interested.

The guy over at the *Wall Street Journal* really doesn't care an awful lot about us bringing Tom Hanks on-line; so we've got an entertainment list, an e-mail list [for people who would want information on entertainment]. Then we've got a business list. We've got a finance list. We've got — we've broken it down into as many different categories as we can so that we can target what people want. It increases the odds that we're going to give them something they want. We don't send everything to everybody.

It's also very important, as I mentioned earlier, for you to understand who is e-mail savvy and who is not. There are folks out there that don't use it. We'll give a journalist, if he can prove his credentials, a sponsored account, which means he doesn't have to pay for it.

We'll send him messages, messages, messages, and finally place a phone call. "Oh, yeah, yeah. I just never check my e-mail." They're not very effective if they're not reading it. So you need to understand who's going to read the e-mail and who isn't, and then target your releases.

All of us know, as professionals, that over and over again editors and writers tell us, "Nothing irritates me more than to get something that neither my publication or I am interested in. Don't send it to me."

When you're using e-mail, generally most of the services will allow you to put a little signature block at the end of your e-mail message, and you can use that signature block to subtly sell yourself and your message. Now, don't be too overt; I mean, these guys aren't dumb, so be very careful. But use that block to tell them who you are, to tell them what your service is all about, and to slip in a little message that may subliminally slip in.

And remember to check your e-mail regularly. In most of the services you have to log-off in order for your e-mail to be updated, so you've got to go on and off several times a day to make sure that you're seeing all the stuff that's in there to you.

As I said earlier, I get at least 120 e-mail messages a day. It can become a beast, so you've got to manage it very carefully.

You can also use e-mail between you and your clients. I'm in the PR business, but we also use a PR firm, and we can very quickly exchange documents. We can review PR plans. They come in to me, I can revise them, I can send them back, and we can very quickly come to an agreement on what we're going to do, [and do this in a way that's] better than we ever have been able to do before. So keep in mind that not only can you talk to the journalists, you can talk to your clients.

Number four. This is one of my favorites. What a tremendous source of information is out there... Cyberspace — good grief, it's all there. You can spend hours out there and not even toast the tip of the iceberg. It's amazing. That also allows you to monitor what people are saying about your industry and about your company.

What you've got to do is go out and identify those newsgroups or those forums that concern your company and then watch, participate, listen. See where the industry is going, what they're saying about you. Be very wary about responding, or getting defensive or being dragged into a flame war; but you can often foresee problems by paying attention to what I'm going to [identify] as "troublemakers," and what they are saying about you out in cyberspace. And, of course, if you can monitor your industry you can also monitor your competitors.

If you have access to the PR news wire you can read all their press releases, the moment they come out. You can read the Business Wire, AP, Reuters, they're all on-line. All of the major services have some sort of search function that allows you to set up folders and pick the kinds of stories that you want, and then they'll build you your own newspaper, so to speak. The *Wall Street Journal* has a special service that allows you to get a customized edition of the *Wall Street Journal*. You can even get stories that haven't even been printed, because not everything that those guys write makes it into the newspaper. You can just get all sorts of intelligence and information out there.

Again — and I mentioned this before, but it bears mentioning again — cyberspace gives a very loud voice to small groups of people. So you, as you become more adept at it, will learn to deal with it; but you've got to remember, don't overreact to somebody who is critical of you, because it's very easy to do, and in the long run you can only lose. And if you say something in writing that you [think] later you shouldn't have said, it's too late, because once they put it out there for thirty million to see on 900 different bulletin boards [it's too late]. And that really happens.

Number five. You can monitor your own effectiveness as public relations people through cyberspace. Those folders that I talked about earlier — did you pitch a story

yesterday? Did anybody pick it up? Do you want to send a copy of it real quickly up to the CEO's office, so that he'll know you're doing something for him? You know, that's a CEO's biggest complaint: "We don't get enough good press." I see some people smiling out there; believe me, I hear it often enough. But it allows you to immediately monitor the press, copy those stories, and send it to him in e-mail to document what you're doing for him.

Research. Do you need demographics, magazine articles, government statistics? They're all on-line.

Speech writing. Before I came here, I went into CompuServe's PR and marketing forum, and in thirty minutes I downloaded thirty-five articles on PR and cyberspace. And interestingly enough, I found most of those people wanted to sell me something. You know, "Here's a little taste. How about buying the book?" But I still got a few good points out of those articles. I also downloaded a guide on comedy writing techniques, but unfortunately for you guys I didn't incorporate any of that into this pitch. See? If you had gone on-line and listened to all of that stuff, you wouldn't have had to sit through this seminar today. You could just read those documents at your leisure.

[This is the] seventh point, if you're keeping score. There is a professional community on-line that has a unique sense of sharing and cooperation, where you can talk to other professionals in a way that you couldn't talk to them at any other time. You can go into private conferences, you can ask them about things that worked for them, you can ask them what they think about an idea, and you can participate in issues debates involving our profession.

I'll give you a "for instance." About three weeks ago CompuServe decided to run a little ad, you know, just to take a little jab at Microsoft, and it had a road construction sign. It said, "Under Construction. So this is the Microsoft network?" I kind of liked it. We wanted to place that in seven key markets, and of course every newspaper in the country is going to accept \$13,000 for a full page ad — except one, the *Seattle Post Intelligencer*. Well, you know me, that's the best thing they can do for me. The *Post Intelligencer* wouldn't run the ad. Okay, save \$13,000, get the PR anyway — I don't care. But on-line in our forum, which has 30,000 members, there erupted this tremendous debate about what had happened. Did the *Post Intelligencer* have a right to do that? Was CompuServe right to exploit the situation? But, hey, I got on-line, I answered notes, and for about two weeks I participated in this debate, and it was great fun. It expanded everybody's mind, but more than that there were journalists in there, and I was debating with them, and what we did is we captured mindshare. People who were ignoring us in the past were now debating whether we were doing the right thing or not. I don't care whether they thought we were doing the right thing or not, as long as they don't ignore us. I had a number of friends on there that went into private conferences and said, "Can't you find somebody else who won't print your ads?" So anyway...

Another thing that you can do, and they alluded to it a little bit earlier, is that you can establish Home Pages for yourself and for your clients, where anybody going onto the Net can get some very basic information.

Our Home Page, for instance, has all of our news releases, bios on our execs, photos, and we have logos on-line that we will give permission to people to reproduce, if for some reason they're writing a story about us and they want to do that. It's a repository of information.

Now, two caveats. First of all, it's got to be interesting enough so that people will go to it. What the folks say to me is, "How am I going to do that? How am I going to build this Home Page?" I say something that we PR professionals often hear: "You need professional help."

So if you want to build a Home Page, go to a provider and get some help, because this designer over here who does a great job building brochures for you may not necessarily do so

well on-line. And you certainly don't want to go out and buy a bunch of servers to support your Page, so you need an access provider, and there's a whole subculture there that you're going to need to deal with. So get some professional help; in the long run it will cost you a lot less than it will to try to do it all yourself.

How do you get people to visit it? It has to be interesting. It has to be listed in some directories. There are a number of publications that often have hot new Home Pages, and there are a number of directories out there that you can get listed in. Or you can do something like we did; we wanted to get people on our Home Page, so we sponsored the "Internet Scavenger Hunt." We went out and we got a whole bunch of partners, and we said, "Okay, here's the deal. All you Internet surfers out there, if you go on and participate and go into all these different Pages that our co-sponsors are involved in, and you dig up these clues, and you get them right, we'll enter you into the drawing; and if you're the lucky individual from Comdex, we'll give you a new car." I wanted to give away a Corvette; I think we're down to a Corolla. But still it's a car, you know. And it's working pretty good. We're having tremendous participation. And all of a sudden this one is drawing to a close, of course, because Comdex is coming up in November, and we have folks coming to us and saying, "When's your next promotion? Man, we never got so many hits on our Home Page. Man, this is great." So we don't put the clues right on the first Home Page; no, you've got to dig down in there so you get a lot of messages before you get to the clue.

Now, I'm going to tell you about something we haven't done yet, but we're getting ready to do, and it was alluded to a little bit earlier as we talked about audio and video technology coming on-line on the Internet. We're getting really excited about the possibility of doing an Internet live news conference with video and motion. You know what's holding us back? Those damn reporters again — they don't have the machine so that they can watch it. But as soon as we feel that technology has reached the stage where all the reporters' machines — or a large group of reporters' machines — are up to speed, we can actually host a press conference with our CEO right on-line. They can see him, they can talk to him, they can ask him questions and they don't even have to leave their desks. It's a reporter's dream, if you ask me.

Now, the last thing. This is number ten. If you decide to go on-line, and if you decide to use cyberspace, you have to promote yourself. Put your Internet address — or your CompuServe account, if you so choose to use that service — put that on your business cards, put that on your brochures, get your clients involved. Tell them to promote themselves. It gives you a hi-tech image. It shows you're with-it. And you'll be surprised at some of the things that you will get back.

Now, there's some problems that you should be familiar with, and the level varies greatly here, so if you don't understand what flaming is I'm going to tell you. It's a nasty e-mail. It's real easy. You know, for some reason, people will write things to other people that they would never say to them face-to-face. We all know it's true, right? Don't get involved in flaming. Don't get flamed. Don't over-react if somebody sends you a nasty e-mail. I'm guilty of it, I admit it, and every time I have wished I hadn't done it.

Open solicitation, if you are too blatant about it, will get you flamed. And as PR professionals, if you send out a note that is poorly written, or has poor grammar or misspellings in it, you will just get hosed. So don't do that.

Another thing that will get you flamed is "spamming." Spamming is posting messages to everybody, to every bulletin board you can possibly identify. That is a no-no in netiquette; do not do that. Your mailbox will fill up so quickly you'll spend the rest of your life emptying it, and your provider may cancel your access. Spamming is a no-no. Don't spam.

“Spoofing” is one of the latest things that has come to light that is causing some problems. Spoofing is sending out a general note that looks like it came from somebody else. For instance, somebody could send a note to some of our employees and make it look like it came from me, and then I’m up in the CEO’s office explaining, “Well, no, I didn’t send a note out there. No, sir, I didn’t do that.” So you have to be very careful, and you have to be aware of those kinds of things. You can usually track back where a spoof comes from, but you have to work through the different providers in order to do that.

If you decide you want to get on into cyberspace, if you decide that you can use this medium, you’ve got to invest some time, some energy and some money. Go out, visit some newsgroups, pay attention, see what’s going on, and read the “frequently asked questions.” You know, a program’s greatest frustration is that it can’t get anybody to read the manual. All the directions are there, regardless of how well they’re written. They’re there, and if you just read the manual it will solve a lot of your problems. So go out and pay attention.

Secondly, all of the on-line services will give you some free time on-line. Get on-line with all of them for a month. Not just CompuServe — AOL, Prodigy, anybody else? Maybe even the Microsoft Network. Don’t stay on-line with them, but get on-line with them, see what they have to offer, and then pick two of them to stay with. What you’ll discover is that all of them have different things to offer, and if you pick one you really are limiting yourself and the things that you’re exposed to. So get on-line, take the free month, look at all of them, explore, and then pick a couple to stay with; for ten bucks a month you can’t beat it. You spend more than that in postage in a day.

Explore the Net. Most of the services now have integrated browsers, which means it just automatically takes you out to the Net when you want to see something. And when you don’t, it brings you right back into the on-line service, so it’s all seamless. It makes it real easy for you, and that’s the trick — to make it real easy for you.

Lurk and learn, and have some fun.

Those are the ten tips, and the ten caveats, and almost everybody’s awake. Thank you.

I always say I’ll be happy to answer questions, and if I don’t know the answer I’ll make something up, so... I either did real good or real bad. Yes.

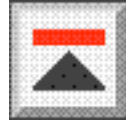
M: Is your on-line news conference [inaudible] individuals had seen the news conference, what would be the purpose of the press before you?

Russ Robinson: We can limit who we allow into the news conference. We go into a closed area, and we only allow certain IDs into it. But that’s a very good point; it also points to something Pam Alexander — I’m sorry, I think it was Jim — said earlier, in that you almost get into the point of being a competing medium. We can take our message directly to our customers, and that’s exactly what we’re doing with things like Bob Massey’s newsletter to our members. The people that we can’t reach are the people who aren’t on-line; and remember, only 9% of the people are on-line, so there’s a vast audience out there. We still need the other medium or the other media to reach.

M: When is a closed — what do you mean by a closed [inaudible]?

Russ Robinson: Yes. I can’t speak to the other services, but within CompuServe we can limit access to groups. I invite you to go downstairs, see the CompuServe booth, and pick up one of those diskettes and start exploring. Thank you.

PUBLIC RELATIONS
HOW VENDORS REACH THEIR MASS MARKET DIRECTLY
THROUGH THE INTERNET



MODERATOR

Tanya Mazarowski
Public Relations Director, Mecklermedia

SPEAKER

Daniel Janal
Janal Communications

Tanya Mazarowski: A couple of months ago I was well-settled into my new duties at Mecklermedia, and Ellis Booker, a Senior Editor at *WebWeek*, called me and says, "Hey, I didn't know you knew Dan Janal." And I said, "Oh, Janal. Yeah, he's that guy that wrote that book." Well, I was in the acknowledgments, and I was thrilled to hear about that. Here's our book.

Dan is a professor at UC Berkeley, and the owner of Janal Communications based in Danville, California. He's an experienced marketer, entrepreneur, speaker, and author of *How to Publicize Hi-Tech Products and Services*, *The On-line Marketing Handbook*, and *101 Businesses You Can Start on the Internet*, [which is] coming out in November. I believe advanced copies are available at the Van Nostrand's booth downstairs.

Everyone wants to start a business on the Internet. Dan was on the publicity team that launched America Online, and he serves as an Assistant Sysop to CompuServe's Public Relations and Marketing Forum. He says you don't have to be a computer wizard to use the Internet for public relations and marketing. He's a man who knows that by just saying "thanks" you can make a person's day. Here's Dan Janal.

Daniel Janal: Thank you. Thank you very much. We're going to talk about three important distinctions in dealing with the media and getting your publicity on the Internet. The first, of course, is dealing with the media and how the media uses the Internet. The second is about how PR people can use the media on the Internet, and the third is how you can bypass the media entirely because — hey, man, you have your own printing press on-line. This will be a hands-on session, and you'll get a lot of tips and tricks and a lot of good information that you can put to use right away to help your companies get publicity.

So what we have now — I'm going to be referring to a study several times here. It was sponsored by the Columbia Journalism School, and it's also referred to as the "Ross & Middleberg Report." It has a lot of good information about how reporters use the on-line services to gather information, to access credibility, and how they like to deal with people on-line. You can get your own free copy by going to the J-Forum on CompuServe and looking for the survey, or you can call a phone number for a copy or with questions, and that number is (212)-888-6610. A lot of good information there.

M: J, J-A-Y, Forum?

Daniel Janal: J-Forum, as in "Journalism Forum."

M: Thank you.

Daniel Janal: Okay? Great. Shorthand, that's the actual name of the forum. Okay, let's get started. There's a quote I'd like to use from the report. It says, "What we are witnessing is

nothing less than the birth of a new way to communicate.” The study highlights the fact that the impact [of the Internet] on journalists is real, growing, and must be understood by all of us interested in being communicators. And this helps the journalists in their essential role.

Over the weekend Marvin Kalb of NBC was talking about the Internet, and he basically says that the journalist’s function is to edit reality for the public. On the Internet there are so many different realities that can [be] posted, so it’s up to the journalist to figure out what’s real, what’s false, and to interpret it. The journalist’s role will never go away; but in the meantime PR people can help to influence journalists so that their products get covered and their companies get covered as well.

But there’s a different edge to journalism on the Internet. [Brock Meeks], who has his own newsletter and has a column in one of the weekly magazines on the Internet, says, “Way-new journalism, by its nature, relies on making itself stand out from the mind-numbing morass of information that flows through the Net.” To stand out takes a certain arrogance, if you will, but it damn well better be what I call “bullet-proof” arrogance. By definition this is a bedrock belief that your facts are accurate and that you’ve not given any part of your story the short shrift. And that’s real important, because [Brock Meeks] was the first computer journalist in cyberspace sued for libel. He won the case, but he learned a few lessons about checking out sources and checking out stories in the process.

The Columbia Journalism School report has a very interesting statistic; it shows that there are lots and lots of reporters on-line. These are traditional reporters from daily newspapers, magazines and consumer publications — it’s not just the technology press. They sent out over 6,000 surveys to business magazines and such. They got back 725 responses from daily newspapers, and when you consider that there are about 1600 daily newspapers in the country, that’s a pretty good percentage of representation. Sixteen percent of those reporters use on-line services every single day; thirty-three percent use it once a week; and fifty percent use it once a month. And what do they do when they’re on-line? A number of things.

First, they can go to PR Newswire and check out company information. You can go down to the PR Newswire booth downstairs, or the Businesswire booth outside this hall. They both have very interesting services where they’ll distribute your press releases to reporters, [which is] what they’ve always done through traditional sources. Now you can put your press releases on-line so reporters can go there, do keyword searches on your company or on your topic, and reporters can find your latest press releases. PR Newswire also has a service called *News On-Call*, where you can actually have your press releases listed for a full year for a fee so it won’t just scroll off the system at the end of the day. So there are a lot of interesting things that both companies are doing to get your press releases out to the public.

One of the cool things about these two services is that anyone can reach those services — and we’re talking about consumers — so if reporters don’t write about your press release, consumers can still find it by doing a keyword search or a company search.

Reporters also look at Home Pages for news. For instance, I was doing a report a few weeks ago and I went to the IBM Home Page to find out what they were doing, because I figure they must have a pretty good site; and on the very first page was the announcement of IBM buying Lotus, and it was official. And that was on a Sunday. Now, you have to remember that a Sunday is not your normal news day. You don’t really listen to the news [on the] radio, and the TV doesn’t have a whole lot of news reports; you’re watching football and stuff like that. By going to the Home Page you’re able to get the news out to everyone immediately, and so it was a very good move on IBM’s part.

Another way that reporters can find information is to do keyword searches through companies that link to all the Home Pages, like *InfoSeek* as well as the more traditional *Yahoo* and *WebCrawler* and such like that. They also look for controversy, and they can find this by

going to newsgroups. It's real important for you to monitor controversy on-line. And you think, "Gee, there are 18,000 newsgroups, how are we going to do this? You know, it would take forever."

Well, there are a number of companies that are starting to monitor this service for you for a fee. For instance, you can go to the *Deja News* site, which is up here; this is a service that was bought out by AOL, who knew a good thing when they saw it. You type in a query for, say, "Intel." Well, Intel had a few problems, and it will automatically go through all the newsgroups for many, many months previous, up to today, and find every occurrence of the word "Intel." So in this way you can find out if people are having a problem with your product or are saying nasty things, or even had realistic questions like, "How do I use your product more effectively?" You can also legitimately add information to those newsgroups and tell people what's going on. So it's a very valuable service.

Are we getting a response here? Well, we are seeing an ad, so we know that part of *Deja News* works. Trust me, it works, it's a good service. You should all look at it at least once a day to monitor what people are saying about your company.

Here's a list of the first 30 hits for Intel; you can even see a few of the keywords so you can find out what was being said, and the name of the newsgroup itself, so you can find out where it's being populated. So it's a very, very good service.

Reporters also use... Okay, there's another way. You can actually subscribe to a service called *eWatch* that's also done by PR Newswire, and here you can do a report for, say, "Travel," and it will show you the number of news articles — that's UseNet newsgroup articles — written about your company or your industry or your keyword, and they also summarize the information as well. So that's another really cool tool that you can use to find out what the world is saying about you.

Reporters also use the Internet to find stories and actually pitch stories on-line. Here's a newsgroup posting by [Kim Baine], who is writing an article for a magazine. she says, "I'm writing an article on demonstrating a return for your Internet investment for a national publication, and I would like to discuss it with both company and agency hi-tech professionals. So if you happen to fit in that mode you can write me later, and I'll give you the address here." So if you look in newsgroups you'll find those [types of] postings from reporters all over the place.

There's also a neat new service called *ProfNet*, which is basically a free service for reporters that lets them post query letters on-line through this service. The subscribers to this service, at this point in time, are university public information officers, so someone could post a note saying, "Hey, I'm doing an article about music. If anyone at your university is doing research on musical instruments of the 1600's, please have them give me a call." Well, there are hundreds of these postings, from consumer to hi-tech to everything.

They are going to expand this service so that it's not just PR professionals at universities and colleges, but PR professionals at any kind of company. And this service is being used by a lot of reporters. Jonathan [inaudible] with *The New York Times* says, "*ProfNet* is the Global Village's matchmaking service for academic and news organizations." *News Day* says, "Experts to the left of me, experts to the right of me, experts on the phone, experts on the fax. When reporters are desperate for experts on esoteric topics, which is all the time, all we have to do is call, fax, or e-mail *ProfNet*." There are also testimonials from *Fortune* and *The Chicago Tribune*. And these are the consumer reporters, these are not the hi-tech reporters. So check it out, use it to keep up to date, and when they actually do go live to have consumer and technology companies [involved] you definitely want to become a subscriber so you can read what reporters are posting.

There are also a number of resources for the media on-line, like the National Press Club, and [Nando News], which has hundreds of links to daily newspapers. You can check them out as well to see what's going on. And there's also the J-Forum on CompuServe, which we talked about briefly, where the journalism report is being held. That has 35,000 members, and they're always asking questions of each other, and some of those are pitches. So in that way you can start to enter into conversations with these reporters on a collegial basis and start to build a rapport with them.

Now, reporters are doing a lot of interesting things on-line that you wouldn't think of. For instance, some of them are printing their editorial calendars on-line. Greg [inaudible] at *PC Week* — he runs the "Buyer's Guide" section — has his editorial calendar on-line. He tells you, "Here's what I'm interested in. If you can help me, get in touch." Other reporters are printing their own newsletters. Doug Millison, the editor of *Morph's Outpost*, has an issue of *Morph On-line* that he publishes everyday, and there's a lot of good information that will keep you up to date on the industry. You'll also know what he's talking about. [Brock Meeks] and other people do their own newsletters, and I think you'll see a lot of other reporters doing it as well. It's just a fun thing for them. I don't know how they're getting paid or whatever, but they're doing it, and it's another avenue for you to get exposure for your company or for your clients.

Other reporters have their own personal Home Pages, like [Gina Smith and Dave Frobridge] of *PC Week*, and basically they list the current articles they're working on, and they have columns, they have gossip, and they have their editorial calendars. So again, it's another way for you to get your company into the media.

More and more publications are going on-line, as you know. All the Ziff Davis publications are on-line; but there are also a lot of daily newspapers on-line, from *The Los Angeles Times* to *The San Jose Mercury News* to *The New York Times*. You know, the Columbia Report says that 75 percent of the companies surveyed expect to have an on-line version of their publication; that's three out of every four of every daily newspaper and magazine that you see. So it's becoming an on-line world, and you want to deal with that world effectively.

So, as we end Part I the summary and conclusion is that journalists are on-line, and they like to use on-line, they like getting news on-line, and they like interacting with PR people and company officials on-line, if you know how to do it correctly. So let's look at how to use the media correctly.

Columbia says, "Although no one can say where it all will lead, it is safe to say that something momentous is under way. As electronic forms of communication grow in popularity and in use, public relations practitioners must not only adapt to new technologies, but embrace them. For public relations practitioners it means an important new dimension has been added to the profession. While personal media relations skills will remain paramount, an entirely new set of writing and communication skills will be needed. Indeed, it is clear that the rules of the game are changing right before our eyes." So the next 15 minutes or so, let's talk about what some of those new rules are.

I see two cardinal rules. The first is: "Be a resource, not a pest." If you pitch a letter to the reporter and he doesn't get back to you, he's not interested. Don't keep on pestering him with other notes, and say, "Hey, you didn't get back to me. Did you get my press release?" They'll kill you. The second says you have to write for the new media, not the old media. There are whole bunch of new rules, and we'll go through those step by step in another minute.

Let's talk about how to build rapport on-line first, and a lot of this is PR 101. You find the right story, pitch it to the right reporter, and make sure it passes the "Who Cares" test. If no one cares about this, the reporter won't either. If only your company president cares about this, you know it's going to fall flat in your face. Also, you must have accurate information and complete information. This is something that reporters know about, where you only tell one

side of the story. Well, on the Internet it's real easy to find the other side of the story and to fill in the blanks; so if you don't tell the reporters what's going on they'll find it, and you'll lose some of your credibility along the way.

Also, in the new PR you need to identify yourself as a company source. Think about this: you're on a newsgroup, and you see a posting by some consumer, and he says, "I like your product," or "I don't like your product," and you respond. Well, a lot of other normal people could be responding too, and reporters do look at those things. That's how the Intel debacle was discovered. That's how Pack-Rat errors and bugs were discovered. Reporters are looking at this stuff all the time. But if you respond to one of these postings, just simply say, "I work for the company." It makes all the difference, because the reporter knows to call you, and they can trust you, they can establish a relationship with you. But if you just post it normally, which is your first inclination, something is missing, because then they think you're trying to fool the public. It's a subtle thing, but that's what happens on-line. On-line is a very, very subtle medium.

So what you need to do is follow these five rules from a friend of mine, [Skye Catonin at Neahouse, Ryan, and Hallor]. Is Skye here? Oh, I thought she was going to make it here. Okay, cool. Skye was actually in my class at Berkeley, and then she was working for [Neahouse], and she's really emerged as one of the superstars in on-line PR. I mean, if [John Barody] at *Business Week* writes about somebody, chances are it's one of Skye's clients. She's real good. These are some of her rules.

One, become friends with reporters. Build relationships with reporters as people, not as editors. You have to get to them and say, "We're both passionate about the industry. We can both make this work. I'm important to you. You're important to me. Let's be friends." That's real important, because a lot of PR people take the attitude that, you know, "I have a job to do, and I've got to talk to this, and I've got to make these phone calls..." That's not the attitude to have when you're dealing with on-line reporters. You have to come at it from a position of worth and say, "I have something valuable," and in that way you can make 500 phone calls, too, because you know that you have something of use. The good reporters respect PR people, because they know that they have information that will help them write their stories. And as time goes by you develop trust with them, and they trust you as a real person. So that helps to get a lot of credibility for all of your clients and all of your products.

The ultimate goal in this is not just to pitch, pitch, pitch, but to develop a relationship so that when they are working on a story their first inclination is to call you and not your competitors. Wait for the phone to ring, or wait for the e-mail to ring; if they're working on something, they'll call you because you have credibility with them.

So there are a number of rules of etiquette to follow in this. First, do they want e-mail? Do they want a phone call? Do they want faxes? Every reporter — are there reporters in this room? One or two, okay. I know this is being recorded, but there are a lot of reporters, frankly, who are prima donnas. I've been on a lot of PR panels where we have five PR people, five reporters up here, and one says, "Call me, don't send me stuff, I don't read stuff." The next person says, "Send me stuff, I read everything. Don't call me, it's a waste of time." The next person says, "E-mail me something. If it's on paper, I don't want to deal with it." The next person says, "I don't have an e-mail account, don't send me e-mail," or, "I only want to deal with e-mail with consumers, not with PR people." Every one of them is a prima donna. Unfortunately, we have to deal with them on their own level.

MediaMap has a very good service where they tell you which technology reporter wants to be contacted in which way. They also have a relationship with PR Newswire where you can send them your media list, and they will know by their database who likes to get material in which manner, and they'll fax to the people that want to get faxed, and they'll e-mail to the people who want to get e-mailed to.

Another word about e-mail boxes. A lot of reporters have several different e-mail boxes, and some are for internal company stuff, and some are just for consumers, so you have to figure out — we have to ask them which box they want your stuff sent to. And again, this does a lot to build relationships with reporters, and a lot to minimize the downside.

Also, don't send a massive list as your PR distribution method. It's okay to send your press release to 200 reporters, but they should be sent individually. If you use the form box that basically says, "Mail to these 200 people that I've targeted," they will have to scroll through seven opening screens listing everyone else's address before they actually get to your message. Nothing will annoy them faster. So send your messages individually; it takes maybe 13 seconds to address a piece of e-mail. It's worth the time investment.

Also, be sure you don't use the reader feedback e-mail number listed as the letters to the editor. That does not go to reporters, it goes to the letters to the editor person, and they don't forward it to other people. So deal directly with the editor that you want.

The new writing style for e-mail is much, much different than what you're used to. It's a style that's much more conversational and less businesslike in tone than the traditional [style], and the length is one screen, not even a page — we're talking about three paragraphs, if you want to get reporters' attention.

The first step in getting their attention is to write a headline that really grabs them. You have to breathe life into the message. You can't say something like, "Virtual Vineyards Data Test of Cybercash." It might be a good headline normally, or a fairly decent headline normally, but on-line it dies. You want to grab their attention, so you'd use something like, "Are you a wine whiz?" That gets them to open up the e-mail.

So you want to get their attention, but you don't want to trick them. So don't have a headline of, "Sex", and then as it opens up you say, "Now that I've gotten your attention, let's talk about life insurance." That also will annoy reporters.

A press release looks a lot different on-line, too. The first thing you do is provide a summary of three or four sentences, and then have the details underneath it, or the full press release underneath it. In this way the reporter can see what's going on and then read it if he wants to. Some other people actually just have a one paragraph summary and say, "If you want more information, hit the reply button, and I'll send you the full release of the full press kit." But a lot of the reporters just want the summary first, and work on it from there.

Also, you want to have your contact information at the top and also at the bottom; that way people don't have to scroll through everything. In some cases they might lose the connection, so this is something else that helps reporters with press releases. This is a good idea that I got from [Charles Piso] at PR — PR, that's actually the name of the company, "PR," that's very clever — in New Orleans. He does food PR, and we were talking about people who are not involved in technology using the technology to deal with reporters in an effective manner. So it's really becoming pervasive.

When you send e-mail, some other ideas are that when you're sending pitch letters you can't use the normal stuff that you use in a regular letter, like, "Dear John, I enjoyed meeting you last week at Internet World. As you requested, I am sending you information about our new product." You have to be much more immediate; people don't want that stuff. So you say something like, "We'll be in town next week, let's get together. You can see a demo of our new product."

[Chris Belky] at Phase II Public Relations booked 70% of her immediate tours through e-mail, and she does it in a lot less time than voice-mail. That's real important, because voice-mail is becoming such, such a wasteland. I mean, reporters don't return phone calls anymore; [a return call is something] that's very, very odd, unless you have tremendous rapport with that reporter. And freelancers don't call back because they don't want to pay the long distance

charges. So e-mail is becoming a much preferred way of dealing with reporters in every step of the imagination.

Also, after you're done dealing with reporters on-line you can't ignore the off-line reporters; as [Nola Armijo of the Jonah Group] says, they get most of the hits from their clients emanating from the public, from articles that hit in the traditional media. They did the PR for the Miss America Home Page, and after they got into *USA Today* there were a lot of hits that hit on the Page. So you can't ignore the traditional press, either.

In fact, here's a copy of *USA Today*, and next to the TV listings they have the cyberlistings of which company executives and which stars and which authors are in conference on the on-line services. CompuServe, Internet, and Prodigy. So here's Spinal Tap and Matt Groening, who did the Simpsons cartoons, and the Barbie Twins; so there's everyone from computer guys to Playboy bunnies. And *USA Today* will print all that information.

Okay. So you might be asking, "How do we launch a product on-line?" Nola's Group has a nice, easy, four-step process. One, you find related sites and post to it. They had a Windows 95 launch, and they went to a couple of Windows 95 sites and asked them to print information; some of them did, and others printed hotlinks back to their Home Page, and that was effective.

Second, go to the Web publications and pitch. Some of the more widely read Web publications are *CNet*, *Web Review*, *Hot Wired*, *BuzzNet*, *Geek Girl*, and *Urban Desires*. And these are run by professional staffs, they get thousands of hits a day, and they're well-respected — plus they can get the information on-line a lot faster than magazines can do.

Third, go to the Internet reporters of print publications, like *USA Today*, *Field & Stream*, *Road & Track*, and [make sure] they write it up, that stuff, as well.

And then go to print publications or broadcast publications that cover Internet products, like *Vogue* and *Field & Stream*. They write about the at-fashion Home Pages, and things like that. So it's pretty cool.

There are also a number of ways that PR agencies use the Web to deal with reporters. The Ketchum Kitchen is a good example. Ketchum has a lot of food clients, so they've created an area called the Ketchum Kitchen, at recipe.com, and you can do things like type in ingredients and it will show you recipes. You can also write to "Dear Sandy" and find out how to cook foods better and do things like that. They create an area of a community, which is a great way to build rapport with your customers and reporters, and reporters can see what customers are saying and develop articles and develop case histories and contacts and leads with real people by exploring your Web site.

Your Home Page can also be used to tell people about what you do, like, for instance, the [Neahouse, Ryan, Hallor] Home Page. Editors can find information about clients and breaking news. A lot of agencies — well, not a lot of agencies, but several agencies — you can have information about your clients, you can hotlink to press releases, you could have news that's happening there. You could also have information about your account executives to show what they cover and what their specialties are. If reporters really trust your agency or your company, they'll know exactly who to go to.

So here's a picture of Skye, and you can read all about her. I think this says, on her bio it says, "As a baby, my first words were "Hi", so naturally I would go into Public Relations." And it tells you about her as a person. It's not just, "I went to this school, I went to that school, I majored in this, I worked for this, I did that." You get a real sense of who she is and her dedication to the industry by looking at this kind of a Page. So they get a sense of her as a person, and it breaks the ice. So that's another cool thing you can do.

So as we look at this, there are new ways of writing for the media. It's real simple, it's real direct, it's real easy, and you must do it if you're going to build rapport with reporters.

The third thing I'd like to talk about is the problem that you're going to have in dealing with the media. Up to this point we've talked about the media as your friend and your buddy. You have a story; they like you, they like the story, they print it, and that's great. But there are a number of things that can happen between you and the reporter that don't work out very well; for instance, I've found at least six ways the reporters can mess you up.

One, they can throw away your story. Anyone who's written a press release — has anyone written a press release here and sent it to a reporter? Yeah, let's see a show of hands. How many of you have seen it in print? None of you — not enough of you are raising your hands, you're not playing along, that's not fair. Okay. Most press releases don't see the light of day, we all know this. There's only so much room in a newspaper, and that's what happens.

The next thing that can happen is that you write a 400 word press release announcing your takeover of your competitor. What happens? They print 25 words. Is your public getting the full story? No way.

Third, they could lump your story with others, so now it's not your story anymore. If you're introducing this great new product, but there are six competitors who are doing things that are slightly different, and some of them are even better... That's something else that can hurt you.

Next, they can add damaging quotes from competitors. A lot of reporters don't want single-source stories, so they call another competitor and they downplay your stuff, or they can call an analyst who suddenly puts a new spin on the thing, and now it's turning into a "trend" story.

And, finally, they can unintentionally add errors. And that's happened to all of us.

So what's a company to do? Lots. You can take PR into your own hands and deal directly with your public through the Internet. Some of the ways you can do this is to create your own private mailing list. Create a Home Page, ask people for permission to send them stuff. "If you want to know about the latest news about our company, give us your e-mail address. We'll send you a newsletter every month on-line, and it doesn't cost you anything. You'll find out about our sales and our new products." Real simple. You can do this by talking to your "Webmaster," or talking to your service provider. It's real easy to do.

Second, you can create your own Home Page. Let's go to the Quarterdeck Home Page, please. Okay, great. On your Home Page you can put lots of information; for instance, all of your press releases, your financial information, case histories, free samples, an executive bio, your stock prices, product information, news. Can we go to the Quarterdeck financial or press release Page? Tanya? Yeah, okay, great.

So, at any rate, on the press release Page you list all of your press releases. Quarterdeck happens to list them by month, so you can search on it that way. Then they go month by month, sequentially, in backwards order, and you click on any of those titles. Click on one, it doesn't matter which. So you see the headline, and then it immediately goes to the press release, and here's the media contacts. And as we scroll down, see the hotlinks? You can send a message directly to the PR person, and here's the headline and then the rest of the story as you'd see in a normal press release. And since reporters are coming to your site, and since consumers are coming to your site, you can present it anyway you like, and you can print it as long as you like. You can get as much information as you want, because they've chosen to be there.

You can also use this as a, as a delivery vehicle for reporters. You can have your pictures on-line as well, so reporters can download the pictures and put them into their articles. The Columbia Report says that many newspapers expect to have pictures and text delivered to them through electronic services within the next two years; it's not just becoming an option, in two years' time it will probably become mandatory. By the way, the survey was

done in August, and they said that in five years this is what we want. They did an update to that, and last month they said that majority of reporters now want it in two years. So it's really becoming — reporters are definitely becoming part of the Internet.

Okay. You can also download audio, so now you can have your company executive do speeches, and interested people can download them. And don't fool yourself — a lot of people are interested in this information. I know there might be some reporters here who say, "Who would want to hear the company president talk for twenty minutes about stuff?" Well, if you're a publicly-held company, all the stockbrokers do, all of your investors do. That's very serious information. So, again, you can download pictures or samples of your product so people can start to play with it or look at it, especially if it's a software product.

You can have on-line conferences for your company executives. As we said before, *USA Today* lists them, and all the major on-line services have these conferences, and they love doing conferences, whether they're a technology company or a rock star. So deal with the appropriate person at America Online or CompuServe or Prodigy, or create your own center on the Internet with *WebChat*, or *InternetPhone*, or *VocalTel*, or some of the new software and tools coming out, and set up your own conference.

A number of politicians are using Internet sites to tell people about what they're doing. Every presidential hopeful has one; *The New York Times* had a list of sites for Dole, Buchanan, Lugar, Specter, and on and on and on. I'm going to show you one here, one that I found just before I started. This is actually done by a competing company, and it's actually not a legitimate site, so it's real important to use this as an example.

Let's look at this, because this is actually funny. I've been pretty dry up to this point, so let's have some fun. This is a "Dole for President" Page, and if you look at it, it looks like it was really set up by the Dole pineapple people.

It looks like a real Page. "Welcome to the Bob Dole for President Page. This Page is here to offer information on Dole's candidacy, his views, and what you can do to help." So far it looks totally legitimate. I was on this Page last week, and the headline was, "Wilson endorses Dole." And you can download screen savers and wallpaper of Bob Dole, and learn how to contribute to the campaign, and read his press releases and stuff like that. It really looked like a totally legitimate site.

Now, scroll down a little bit more, Tanya, please. We see a bunch of links. And, again, it looks like a very traditional Page about crime, about drugs, about — let's see, it's "Family Values." Can you click on Family Values, please? This is the first inclination I got that something was wrong. This may take a second to load in, so bear with me here. Please connect... And... It's the Marilyn Monroe Home Page. The Crime Page [from the "Dole for President" site] links to the Microsoft Page. Can you link back, please? Thanks.

At this point I realized that there was something very wrong at the Dole Organization Home Page, and if we go down a little bit more, please... Scroll down, please.

"Flash — Peter Wilson endorses Dole." Again, it looks totally legitimate, except for a few things — like, you say, this is weird. There's biographical information, there are facts, there are press releases and such like that. And right before I went on, a gentleman in the audience — is he still here? Yeah, he's still here. He actually did the legitimate Bob Dole Home Page. And I said, "Hey, your site got hacked!" It turns out that this is another company that's just doing this as a goof, God knows why. They're having a lot fun, and probably confusing lots of people at the same time.

The point is that if you do have a Home Page, check it and make sure that no one is hacking it. Use variations on your name to make sure that no one is setting up a Page that's making fun of you. For instance, look at the Ketchum Kitchen Page; I first typed in things like Ketchum, and that wasn't it at all, it was *recipe.com*, so in this case they didn't have the right to

their own name, or they didn't choose the right to their own name. You might use a company name, like you might have another product. Get the license to both of those names, as both ".com" and as ".org," and even as ".edu", if you think it's necessary, so no one else can steal your name and put stuff like this up there without you thinking about it — or without you knowing about it, rather.

There's a lot of things you can do on the Internet to raise your credibility, to talk to the media, to talk to the public. And as we close, because I know I'm running over a little time here; in short, credibility in cyberspace will be hard to establish. It will also be easy to lose. Remember, it will be easier for reporters and editors to check the validity of on-line material, and as a result they may even penalize companies for accurate but incomplete data.

What we are witness to is nothing less than the birth of a new way to communicate. The study highlights that the impact on journalists is real, growing, and must be understood by all of us interested in being communicators.

So, in summary, the Internet is changing the way reporters work, and PR people must change the way they work with reporters, and the Internet allows companies to bypass the media and deal directly with consumers.

Thank you. Are there any questions? You can applaud, it's okay.

KEYNOTES

JAVA AND THE FUTURE OF NETWORK COMPUTING



INTRODUCTION

Bill Washburn

Senior Vice President for Internet Business Development, Mecklermedia

SPEAKER

Dr. Eric Schmidt

Chief Technology Officer, Corporate Executive Officer, Sun Microsystems, Inc.

Marc Benioff

Senior Vice-President, Oracle

Bill Washburn: Ladies and gentlemen, it's a pleasure to be here with you this morning; and I apologize for the various technical difficulties that we're experiencing in this tent.

I'm struck by the fact that, unlike so many audiences in shows of whatever sort, this seems to be a situation, given perhaps the physical environment and the temperature, that has brought the audience rather closer together to each other than is ordinarily the case. Usually we try and find an extra seat in between us, one person and another; and in this case, anybody we can find, we'll use.

It's certainly exciting to be here in Boston, and I'm grateful to all of the people here in Boston and from around the country, and even from around the world, that have helped make this event possible today and this week.

I hope that you have a great experience here, and that you're successful in accomplishing the things that you're here to accomplish; and if there's any way in which I can help you at all, please know to come and see me.

I'll be in the conference area in the exhibit hall, and with the registration people and the like.

I'd like to say a couple of things in particular. We especially want to thank IBM for bringing the Net to Internet World. I hope you realize that IBM, or if you don't realize it yet that you will soon realize that IBM, is providing six megabits of bandwidth to each of the demonstration areas. I'd like to say that this is a great effort, and I'd like to very much thank IBM for all they've done with respect to the network. Thank you very much! In the days to come, we'll let you know about the activity on the Net from the statistics that they gather.

My children taught me a long time ago that my attempts at humor failed, almost always, and that it is not something that I should ever quit my day job to try and do.

So in that spirit, rather than trying to give you any levity this morning, and recognizing that this is the end of October and that Halloween is upon us, and also given the fact that some of you might even be shivering a bit, I thought it might be appropriate, rather than to humor you, to try and scare you a little bit.

So in that respect, I'd like to mention something that I saw on the Risks list this week. It's respecting...

(Plane going overhead)

Bill Washburn: Airplanes in the Boston area falling out of the sky; indeed!

A company named Deja News, a play, I think, on *deja vu*, Deja News, an Internet archive, that was on the Risk list, commented in terms of the fact that they archive all of the messages posted to UseNet News.

They index, catalog, and provide that information to the Internet community. By the way, if you want their address, <http://dejanews.com>; Deja News.

Anyway, it's become a bit of a concern, because they are able to do things like profile individual user names in terms of what they like and what their interests and likes and dislikes are, and the like. So far they do not, but will soon, start indexing the alt, talk, and society, or soc, news groups as well. They don't today.

In any event, given the capability to index everything in sight backward and certainly forward, I advise you not to be unaware that this is a public environment, and that what you say will be recorded.

This is stuff that is known to all kinds of interested groups, including law-enforcement groups, the National Security Agency, and others in the business community.

And finally, whatever you do, don't post your Social Security number to UseNet News, ladies and gentlemen.

Having taken that little time to make sure that we had the opportunity to experience an airplane or two, I want to introduce to you Eric Schmidt, Chief Technology Officer at Sun Microsystems, and part of the Internet community for a long time. He helped in the development of UNIX with Bill Joy at Berkeley, and ongoing at Sun Microsystems for the last 12 years.

His duties and responsibilities are to continue to investigate and understand the Internet-Web technologies, and to guide the Java programming language development further on into the Internet.

We actually delayed slightly our new Web site so that we could take full advantage of the HotJava browser, and we're certainly excited about it.

Having said that, I'd like to introduce to you, ladies and gentlemen, Eric Schmidt.

Eric Schmidt: I think we have a lot to be proud of.

The latest testimonial is that there are 14 million users of the Web, at least occasional users of the Web. We're all familiar with the growth rates that our industry is now taking, and I think it's pretty incredible.

Think about this show a year ago or six months ago, and how it's exploded from its various venues. Now we're in a tent; moving from site to site with our tent.

The question I want to ask is: is it possible, is it just possible, that we are under-hyping the Internet? Does anyone here believe that?

Well, I do! Of course, I'm biased. And let me tell you why.

You have before you the most significant opportunity since the introduction of the personal computer in 1981; right here! That's pretty exciting. Somebody is going to make a few billion out of that. Maybe it's somebody in this room.

(Of course you can't see my slides, but that's okay. It's okay; I can't see them either. It doesn't matter if you're in the back or the front. This is good. You know, you're supposed to pause during your talks to think about what you're going to say next; and that's 14 seconds, which is plenty of time to think.)

So, the Internet Society estimates that there will be 187 million users on the Internet, 187 million computers, nodes, what have you; and countless others will be in corporate nets.

At that growth rate, there are a lot of estimates that say that, for example, in seven or eight years every human being on the planet will have a home page.

That's kind of a problem, because only one out of five have telephones. But at least in this community, maybe it's more important to have a home page than a telephone.

Now, the good news is that our industry is planning ahead. The successor to the current IP allows for 131 million IP addresses per square meter of the earth's surface! Which is probably a lot. Now, furthermore, you can concatenate addresses, so you can go beyond that, in case we colonize other planets and stuff like that.

Now, we are busy constructing the World Digital Library.

The Web has become the place where all information, because all information is digital, will sit there; and that means every thought, every utterance, every next Thoreau, every library in the world. This has profound implications for all of us.

What's the next Internet explosion? It's probably cellular phones.

Here you have a cellular phone, which has a 40-mips processor in it, which are, in theory at least, continuous connections. The next 100 million IP addresses, remember, we have 131 million per square meter to get to, your next generation will almost certainly be there.

So the underlying premise, which is the world of digitally connected IP addresses and the Web as the world's digital library, is a very, very profound one.

Now, what is the first stage of this new world? I believe that it is the destruction and then construction into a new model of the economics of the software industry.

The reason I say that is that the industry is built on the concept of a software lock-in, an API lock-in. The interface, whether it's Windows or Mac or whatever, is the thing that you're locked to. Just try getting one of those pieces of software running on something with which it's not compatible to what it was compiled to.

We intuitively understand this. In fact, the stock-market valuations of these companies often reflect the value of the architectural lock-in that they have. For us, it's sort of normal; we grew up with it; it's the way the world works. Everyone wants to be the next Windows API or the next lock-in of one kind or another.

But then, something funny happened.

Tim [Burners-Lee], who I consider to be one of the great examples of the technology law of unintended effects, was trying to build a system which allowed him to communicate with his physicist friends.

And Mark Andreessen and other sort of inspired 21-, 22-year-olds, all thought, well, this is neat, it just lacks an user interface, because we're the MTV generation. Right. Makes sense.

You want to use your interface with this data. All of a sudden, a new paradigm begins to take shape, and that new paradigm consists of HTML.

In the last year, many companies have come to see me who have seen the light about HTML. HTML, I assume most of you know, is the format that the pages use when they're displayed on your screen; and so the typical demo, browsing demo, uses the HTML page format.

HTML is going to become the world's user interface, because it's much easier to write a program that spoofs being a Web server. It says, I look like a Web server, but I really am not a Web server; it just shows you its data.

A good example here would be quote.com or *Pathfinder* for those of you who look up stock quotes. You type in the stock quote that you want, and a page comes back to you, and you say, well, that's great, I'm using the Web.

There's no Web there. You're just using HTML as an user interface over the Internet to a server which is giving you the output of its program. Very simple.

Something interesting happened along the way. You see the same user interface, whether it's on Mac or Windows or UNIX. All of a sudden, content is king! If content is king, then all of a sudden that interface lock-in, that architectural lock-in, becomes less important.

I predict that within the next six to nine months virtually all of the software companies represented here, and the rest of the industry, will offer HTML interfaces.

All of the major operating systems vendors, from Microsoft to Apple and Sun and so on and so forth, have all indicated that they are bundling or making generally available Mosaic-, Netscape-, class browsers; and that will become the predominant way in which you all use your data.

Now, what's the problem with this? This is pretty good! Interesting revolution. The content is dead. Nothing happens.

The content is dead because the information is presented on a server, and that information comes to the client, and if you want it to change you have to execute something called CGI binstrips, which go back to the server, get the data, and then you wait again.

That takes a long time; there's a lot of bandwidth involved.

Now, this is an example of another premise that I have, which is that HTML is really the DOS of the 90's. Think about DOS. What were the benefits DOS has? Right? It's a really long list. In 1980, think about DOS. Nothing comes to mind.

In fact, the thing that's funny about DOS is that it has no benefits whatsoever. In DOS I, it even corrupted your files; but it did have one benefit, which is that it was ubiquitous. And the fact that DOS was ubiquitous led many, many people to go fix it.

And the ubiquity of DOS created the opportunity for Windows, created the opportunity for Windows to get fixed, and so on and so forth, and created a whole industry. We're now there. You know the whole story.

So, I believe that HTML, and I mention this notion of the content is dead, will be extended, again by folks in this room as well, to address the many issues that it has. You don't get accurate data representation on the screen and so forth; that will all get taken care of. But the most important thing to do is to figure out a way to use HTML as the next- generation platform for computing, and that's what Java is all about.

The history of Java is that it was designed originally around a small set-top box, and that was back when we thought the set-top-box world was going to sort of take off, and we were, like many people in the industry, very early.

The language itself is a derivative of C++. It's essentially C++ without the guns, knives, and Mace; all right. We went through C++, and we articulated all the things that were in there that we didn't like, and we thought would allow security problems of one kind or another. And by making these changes, we allowed people to write applications which have three important properties.

The first property is that the application can give you interactive content, and you've seen that demo. We'll show you some of the new stuff in just a sec.

The second thing that we do is we run a virus scan. What happens is the Javaprogram comes in, and we do a byte scan. We also then run the Java program in its own interpreted space. We don't let the Java program do many of the classic virus kinds of behaviors.

And finally, because of the way the language was designed, and the virtual machine was implemented, that system is machine-independent.

Therefore, Java programs literally the same binary, in the sense of the job of a virtual machine binary, can run on each of the different platforms.

So one of the consequences of this is that information is the sort of content platform; and now applications and information together can become the new content platform.

Now, Java is to C what the Net was for the microprocessor; and because it's machine-independent and it is safe, you have the properties that you can write programs, and they can be moved around.

Now, the examples that we've used have Java programs sitting on Web servers and moving to the client. There's no reason why you cannot also have Web servers where the program is authored into the Web server.

I believe that ultimately Java will be seen as a replacement for C++. Inside of C++ is a small language waiting just to get out; and for those of you who are serious C++ programmers, you know of its complexity and the issues that it faces.

So, one of the reasons why the Java phenomenon is taking off is that programmers actually like it. They find that it's simpler, and it has the support that you need.

Now, who needs a new language, right? So, we decided that we would focus on the business opportunities in the Internet. And our idea was to work with partners.

I have an opportunity to announce some new partners today as well. We've already spoken about Netscape as a partner that Sun had for a while. (Can you come on up?)

Our strategy is to license the technology first. If you want to use the technology in binary form, you may use it without any restrictions from us, whether it's noncommercial or commercial. We have been working with partners to take the implementation that we have done, the licensing.

In addition to that, the interfaces to the language, the specification, are all in the public domain; so if you don't like our implementation, with the open-interfaces and open-systems principles that we believe so strongly in, you may do your own implementation.

I'm pleased to introduce Marc Benioff, who is the senior vice-president from Oracle, to make some comments from Oracle about all of this. Go ahead. Do you have a mike?

Marc Benioff: Thank you.

Welcome; and through these various obstacles this morning, between the light and the sounds, the good news is that it's not raining. Torrential rains were scheduled for today; but I guess by various rolls of the dice we ended up with a beautiful day, which is something that we all can be thankful for.

Tonight, as some of you may know, at 5:30, Larry Ellison, who is now en route here, will be making a rare public appearance to announce the Oracle Web system, which will be the first public demonstration of Oracle's new Internet technology. We'll be showing some new browser technology, some new server technology, and a complete application development toolset for Web-based applications based on the Oracle data base, and also on Sun's new HotJava technology.

Oracle Corporation has been a leader in the development of open systems now for almost 20 years; and one of our most strategic partners during that effort has been Sun Microsystems.

Together, we've really been pioneering the concept of UNIX open systems, client-server-computer, and really bringing a new way of computing to the large organizations.

Well, we want to do the same thing with network computing. As Eric has been pointing out this morning, we're absolutely convinced that we're on the verge of a new paradigm. The first paradigm was the mainframe, the second paradigm was the personal computer; and now we're moving into the third paradigm of computing, the network.

As the networks becomes the next paradigm of computing, we need a whole new generation of software and services to make that happen.

Well, Sun and Oracle understand that very well, and we're working together very hard to bring that technology to you. So tonight at 5:30, we will be demonstrating that technology for the first time.

We'll be doing something else. Everyone who comes to that event will receive this CD-ROM; and on this CD-ROM is a full production Web server from Oracle, which includes our Oracle 7 data base as well as our new CGI interface and http server, as well as a beta version of our Oracle Power Browser, which is an application development tool for the Internet based on the visual basic language, and even has its own local http server right inside the browser.

We think this Power Browser, combined with the Oracle Web server, provides a new client-server solution for all Internet applications.

We'll tell you all about it, and give you a complete demonstration, at 5:30 today. If you come, you'll not only see Larry, but more importantly, actually leave with the software to make it happen.

Eric, see you later. Thanks, and congratulations.

Eric Schmidt: I'm obviously excited in helping Oracle make a strong endorsement of Java and the Java approach, and the kind of things I'm describing.

In two hours, in San Francisco, Macromedia will be announcing a major endorsement of Java as well. They will be announcing full endorsement for Director and AuthorWare, which are, as you know, their branded products. They control together about 80 percent of the market for multimedia authoring. They touch more than 300,000 creative professionals.

They're also going to be working with us on some multimedia class libraries in Java, and we will jointly develop a new tool for technologies targeted at high-bandwidth rich-media applications over broadband networks. Again, we're adding more folks to the Java phenomenon.

Now, I wanted to take a minute and talk about security, because I think that's important. It's the obvious concern. We take this very seriously. My view is that what the jet engine is to biological viruses, the Net is to computer viruses.

We believe that it is very difficult, because of the way Java was designed, using the browser technology that we have made available to our licensees, to write viruses. Part of that is because, when they run in that protected address space, we make sure that they can't do terrible things like delete all of your files. We will, over the next year, be adding significant RSA and other kinds of services and capabilities in order to make sure that all of that actually takes care of itself.

Now, the real question, and you all can spend a lot of time, go to Java, what are the implications of this new paradigm? I think the first is the impact on the business model in the industry. As I discussed earlier, this is the complete business model, the setup around an API lock-in. Well now, all of a sudden it's less important which platform you use, and more important which application you use. That means the power moves to the applications developer, which I think is a good thing.

The second impact is that it creates an opportunity for a new kind of computer device. There are a lot of names floating around for them. One was called the Net Surfer. It's a device that you hold that has http and e-mail access.

I've called it an impersonal computing device. It's not a personal computer, it's an impersonal computer. Think of it more as an Internet appliance. The idea here is that you would go up to some kind of a device, whether it be a nomadic device or a tabletop device, and with that device you would have access to the things on the Net.

So the trick here is that you can just walk up to these devices and get access to all of this information, and that may in fact fulfill the image originally that you've heard about PDA's and other kinds of devices like that.

When I think about the television, for example, the television is really an impersonal device. When you walk up to a television, you configure it. If you have children, you know they configure it to a different state than you left it in.

A consequence of this is that it turns all of our operating systems, really, into legacy systems; and it becomes much more important that the applications be HTML- and http-enabled.

This new Internet desktop that I was describing could be called a "net-top." It's something that has the ability to see the information, display itself, and so on and so forth. It's the natural successor to an X Terminal.

What's interesting with this new model, remember, mainframes had this benefit that you had centralized control, administration, things were backed up, but you didn't have any flexibility over computation.

PC's have this wonderful property that they're yours, and you can control who uses it and the performance and all that kind of stuff, but it lacks all sorts of systems-administration capabilities.

So in this new model, what happens is that both the program storage and the data storage occur on the server, which is [a] replacement for the mainframe, and that's the right answer. And the computation, that is the actual execution, occurs on the personal computer, impersonal computer, nomadic device, or what have you. That's the right answer. That's splitting the computation, the data, and so forth, exactly right.

There's another reason to believe that this will occur. Corporations have been studying the costs of this personal revolution, the costs of workstations and PC's; and most estimates have costs of administration and maintenance of those individual computers as many factors higher than the costs of the devices themselves, by the time you bundle in software and training and systems administration.

So any technology which allows corporations to more highly align and more highly centralize their servers, for example having servers where they store the programs and that kind of stuff, so they don't have to go out and touch all the personal computers that are in the corporation, is a huge cost savings. They can justify complete redeployment on that alone.

I don't know what the new business models in this world will be.

So here's some new software, where the software comes with the content; call it executable content. The data and the program come together, they run on any platform, they come over the Net, they can be cached if you have latency problems on the Net.

How do you sell those products? Do you buy them? Do you lease them?

There are some people who believe that the software model that we have today will be replaced by a complete inversion, literally a completely new model, where you will subscribe to components with a monthly fee.

Instead of buying what we historically view as monolithic apps, which take 10 or 20 megabytes of disk space and are as complex as operating systems, instead you will purchase on a subscription basis only the tools and components that you need.

And of course, as new versions occur, you will naturally get the new versions, because they get downloaded automatically.

That new model is certainly intriguing, and may in fact be the way the money begins to flow into the model that you guys and we are all proposing.

So, in the old model, you have monolithic applications with dead content. In the new, you have hyper-linked content with small applications.

I think that this is, by the way, a snowball effect. How can you-all help? Well, if you give us an implementation of one of your new data standards, we can include it in our technology and make it generally available.

We'd like to encourage you to think about using Java for programming. There are some estimates that one half of C++ is bugs or storage bugs, which are fixed in Java. Another half are exception-related, also fixed in Java. Another half of them are scripting-related, which are fixed in Java. So in theory your program should be significantly more reliable because of some of the changes that we've done.

And obviously we would like you to license Java from us and embed it in your new platform.

Russ?

This is Russ. Come on up. Let's see if we can do a quick demo. Russ has been wandering the Net, and let's see what you have found.

[Russ]: What we have here is, we're going to bring out a couple of things.

M: Can't hear!

[Russ]: What I have here is the financial portfolio demonstration, which shows the Java applet running here, when it comes up.

Here we go; yes. It shows the stock ticker on-line.

Eric Schmidt: For those of you who can see, don't be too worried about the stock prices. They're canned. It's not necessary to leave the tent.

And the idea here is that each of these graphs is an applet; and what they do is, as the stock ticker comes in, the graph shows the changes in the stock price, and then a little bit lower we actually have a spreadsheet object, which takes those and computes your net worth.

[Russ]: We have a couple other ones.

Eric Schmidt: This is one of the home pages off of Java, so you can run all of these yourself.

[Russ]: This is a nice little demonstration here.

Eric Schmidt: Again, each of these are applets.

[Russ]: What else we have here is, we show the same financial page on the Netscape browser.

Eric Schmidt: This is Netscape Java. Again, the important thing is, different browser, same input. We have the sequence right. It's the plane and then the car. (Laughter)

[Russ]: This is one I like. It's a crossword puzzle that was done. Here you can basically type in a word. It lets you know what's going on.

Eric Schmidt: Film actor? (I was doing the crossword puzzle.)

[Russ]: It's going to be...

Eric Schmidt: Cagney? . . . Keep going. This is a losing proposition.

[Russ]: Go back to a HotJava application. This app would actually stop loading. This is a derivative calculator that was written by a local systems engineer, coming up.

Eric Schmidt: We're waiting.

[Russ]: Yes.

Eric Schmidt: Something happened here.

[Russ]: This here is a nice one.

Eric Schmidt: Yes. Very popular.

This is the proof, of course, that a real demo is the test.

[Russ]: This is...

Eric Schmidt: There are many of these. Java appears to be perfectly positioned for making your pages more dynamic, more interactive.

We believe that Java will be a much broader language; but not necessarily for, keep going, not necessarily for a while.

We think the first users will take applets and will actually use it to spice up their home pages from a marketing and merchandising perspective.

[Russ]: This is StockPulse.

Eric Schmidt: This is the NanoTimes. This is a new newspaper, where you both get the data and, in this particular case it's a North Carolina newspaper. You see the ticker tape, and if you click to various icons you can choose programs and show them dynamically.

So, with that fairly brief set of images, what I'd like to encourage you to do is that when you get a chance, there are a number of machines that are Java-enabled around the show, you can play some more demos and get an individual idea of it.

I appreciate with all of you bearing with us in our tent, and thank you very much!
(Applause)

Bill Washburn: Ladies and gentlemen, thank you very much; and whichever of you had the car alarm, better luck next time. Sorry about the noise.

KEYNOTES ENTERTAINMENT ON THE INTERNET



INTRODUCTION

Jeffrey Dearth

President and COO, Magazine and Web Group, Mecklermedia

SPEAKER

Martin Schoffstall

Senior Vice President and Chief Technical Officer, PSINet, Inc.

Jeffrey Dearth: Good morning, everyone, and happy Halloween. We have a real treat in store for you this morning; one of the true early pioneers in the Internet industry, Marty Schoffstall, is joining us. He is the Senior Vice President and Chief Technical Officer of PSINet, Inc., which he co-founded in 1989. Just to give you a little bit of his background: Marty is a graduate of Rensselaer University, and he worked for BBN for a little while before getting the entrepreneurial bug and getting involved in various startup companies, including NYSEnet, which is the New York State Educational Network.

Many of you know that his company, PSINet, went public in May of this year, and since then his company has been very active, recently buying Intercon. He is truly one of the pioneers of the Internet, and he is here to talk to us today about real-time Internets and interactivity. Please join me in welcoming Martin Schoffstall.

Martin Schoffstall: I think the pioneer metaphor fits well in a tent; I just hope we next year can go to log cabins. I'm here to talk about some more pioneer visions with regard to the Internet. My pioneering vision for PSINet and the Internet is to look at the next generation of the Internet — which basically I call the “real-time Internet,” for lack of a [better] phrase — for both business and entertainment.

What the current Internet provides, from my perspective, in all its myriad forms, in myriad countries, through myriad providers, is basically universal IP for dial-up PCs to T-3 connected server platforms. This is an enormously complex worldwide topology and interconnection. It is basically ill-definable, because it changes on a minute-by-minute basis based on the next company coming in, [such as] the newest ISP in Ethiopia or a new trunk from some telecom company in some state, city, parish, or country.

The current Internet platform really supports an old application model, an application model that I got involved in in 1981. There are obviously lots of people who have been involved in the Internet application model or the Internet protocols even prior to 1981, but from my perspective the application model fundamentally is the same over the last fifteen years. To me, it looks like client/server; the Internet did client/server before we even knew what client/server meant. It does unicast, [where] one thing talks to another. Almost all the applications that we know today — clearly all the applications that the average engineer, programmer, CEO, or executive uses — are clearly in this old model.

The current Internet provides the model application/service paradigm that deals with textual applications and limited graphical applications — and, yes, I'm talking about the WorldWide Web. From my perspective that is a limited graphical environment at best; the current Internets do not provide anything like the bandwidth commitment, or any latency guarantees — which means delay guarantees — or any kind of prioritization, or any uniform, widely-used, agreed-by-the-community, agreed-by-business, agreed-by-all-the-application-people security structure.

As I think about the current Internet — again, something that I have been involved in for fifteen years, and have tried to move step by step through for all that period of time along with a myriad of other people, either in cooperation or in competition — I think the Internet really looks like the U.S. Postal Service in terms of metaphor; specifically, the bread and butter first-class mail. Believe it or not, the U.S. Postal Service is one of the most cost-effective mail movers in the world, and in fact it's number one according to most people's analysis at this point in time. It works extremely well when it works; and when it doesn't, like at Christmas time in D.C. or Mother's Day in Detroit, people get, at a minimum, frustrated. Now, if we think about where we were in 1960, this is all we had, pretty much — the U.S. Postal Service — to do what we wanted to do in terms of communications.

What I think is needed today is an additional Internet model. It's not a replacement model; clearly in the post-FedEx, post-UPS world the U.S. Postal Service continues to survive and grow. But we need an additional paradigm. From my perspective this can be driven by real-time Internet, which needs to support rich media that includes audio, video, 3-D graphics, and much, much more. That's not to say that the old model doesn't do this; it does, kind of, just like you can send any kind of multimillion-dollar scientific instrument through the U.S. Postal Service, or you can send your bearer bond of one million Deutsche Telecom stock through the U.S. Postal Service if you want. It's not that I can't do it; the question is, are those things the optimal thing to do in the old paradigm?

This new, real-time Internet needs to support newer corporate applications, which are things like real-time document conferencing, document management, et cetera... There are plenty of other applications there. We need to support gaming, which I am going to get into a little bit more.

And from my perspective, we have now built PSINet to do all these, to do the next-generation, real-time Internet. If I think of the new model as a metaphor, an additional model and metaphor for the Internet, I like to think about the FedEx metaphor. Minimally, what FedEx does is guarantee delivery; it prioritizes delivery and it delivers by a certain time. I say the real-time Internet basically provides the interactivity future that we have heard about probably for the last five years — and probably too much [about] in the last two to three. The real-time Internet is going to be the platform for the business end-user applications. I think of this real-time Internet as providing the bandwidth which will support the rich media types that we need for corporate and consumer applications. I think it will provide the low-latency, which will be obviously required for interactive media, real-time interactive media. Obviously, TCP/IP has proven that it is a universal programming platform, and obviously the Internet is the leverageable distribution media or mechanism that people ought to take advantage of. I think for some of you out there, this is not new news.

In the real-time Internet, I say that on-line doesn't work. We know all about on-line, or some of us do; centralized resources and proprietary architectures basically will not scale. The terminal-to-mainframe architecture won't work, centralized communications won't work, proprietary protocols won't work; they represent, from my perspective, high-latency networks, whether they're X.25 or router-only networks. I'm going to get back to that.

It's not going to happen because they're poor for any interactive applications. You punch your letter into the U.S. Postal Service — [the letter] that has a clipping of your engagement announcement — and you know it has the same priority as that million-share Deutsche Telecom bearer bond. Same priority, even though maybe one is more valuable than the other.

If you take a look at what on-line has done in terms of caching, from my perspective caching will not work in this interactive world. It somewhat works in the current Web; it has worked because what we had is thousands and tens of thousands and tons of thousands of people basically all trying to read or look at a shared document, a shared HTML piece of data.

That's not the interactive world, the interactivity world; these are once-only transactions, transactions with my friends, transactions with my business partners, transactions with whoever, and they are not in any way shared. In fact, they have a lifetime or a life expectancy of seconds, not hours, days or weeks.

My view of the required Internet infrastructure is very simple. We have the applications which we all use and we're all familiar with today; they are, of course, a shadow of what we will use two years from now, let alone ten years from now. We have the IP which we all know and love — or use because we have to, depending on your view — and below that we have to basically put in place in the Internet an ATM/FR infrastructure. We layer the IP routers over the ATM/FR switches in the worldwide Internet, we configure the specific servers and routers to take advantage of this ATM/FR infrastructure — which provides prioritization, the guarantees, and latency — and it works in the current installed base of applications and application models.

What this means is that we don't have to go back to every Windows 95 PC, or every Mac running Intercon software, or every PC running FTP software and upgrade it to some new TCP/IP that will only work for us. We can use the current installed base of millions of PCs, millions of servers and workstations, without change.

What we have is a situation of Virtual Internets. The PSINet technology that we have put in place, and is operating today, allows for Virtual Internets to be created within the PSINet switching fabric, the switching fabric at the ATM/FR switches. Not only applications can be managed and prioritized, but so can the Virtual Internets, for vertical applications or horizontal. Advances in network management and delivery of any virtual Internet benefits all the virtual networks within PSINet; we're going to talk about an application, a specific example where I think that is true. And my perspective customers, whether they be corporate customers or consumer customers, can participate in any of these Virtual Internets.

So from a picture perspective we have something that looks like this: we build the ATM/FR infrastructure; it is as complex as we need it topologically, and as complex as we need it technically — on the order of 200 to 2,000 ATM/FR switches, which is large. These switches exclusively move the bits around the country or around the world. To move the bits, we're not interested in using a router; routers are slow. Why are routers slow? Because they have a lot of header things to do, because they have a lot of routing things to deal with, because they have a lot of stuff to do. They're good traffic cops, and in certain applications they work rather well, but in the wide area, networking Internet they do not necessarily become a switching fabric for the highway system; that is for ATM/FR switches.

From PSINet's perspective, we put this in place in the first quarter 1993. Not 1995, not as a plan for 1996, not as a deal announced this week, but as something we actually had operational in 1993 in the first quarter.

Again, to build a real-time Internet we then add the routers. They're great traffic cops. They're great "homologators" for people who like to concentrate certain types of traffic; specifically, dial-up traffic is a good example. And we add servers, servers for the specific applications, servers for the real-time Internet applications that we want to see work. Now we can provide different types of IP service and IP topologies to support them.

Inside the switching fabric we, at a minimum, have three kinds of virtual IP networks. One is standard-priority Internet services that we all know and love, the stuff that we've used, some of us, for fifteen years or more, or some of us for only two to three. The second kind of service that we can provide is a lower-priority Internet service, and its associated servers. Now, you're probably thinking, what would be a low priority? Well, the good news is that you, as a corporation or individual, can decide what's low priority; you have that choice. We are going to come back to at least one application which I think is a low priority, but I'm sure there will be a little heat on that issue. The third [service] that we see in this real-time Internet, using this

infrastructure that is being built, is a high-priority, real-time Internet service with all of its associated servers.

From my perspective the key — and especially the key to the high-prioritization services, the real-time service — is that the servers need to be inside the network, and they need to be distributed. I think that is also true or more easily true with the lower-priority services, but absolutely true for the high-priority services.

Let's take a look at a high-priority application for the business community, which I call "business video." In this example, using your classical T-I pipe and your customer router, I now have — for lack of a word — two permanent virtual circuits, which is a terminology; but they could be switched virtual circuits if you cared, where 340 kilobits of that T-I have preempted access on the pipe to do business video. So if you want to watch CNBC, if you want to watch CNN, if you want to watch Donahue at work, that's a priority too, and you can ensure that that traffic gets to you. You can leverage your Internet application from PSINet to do this. The rest of the pipe is on another PVC where the standard IP services happen, which could be FTPs, which could be mail, which could be Web. Now, for your company this [high priority] is video; it may be rocket science in the future. Maybe your high-priority application is your Web server, maybe it's your coming audio server, maybe it's your FTP server; but you as a corporate customer get to decide that.

So what's the low-priority service? Anybody have a guess? UseNets, my favorite low-priority service. Again, looking at the T-I application, looking at a corporate LAN environment, you create a 128K PVC to the UseNet servers and to PSINet and you say, "yes, I want the data, yes, I want it when I want it, yes, it'd better be there, PSINet better provide it," and it will. However, as the customer, when the Web stuff comes in, when the file transfers come in, when the mail comes in that people have to use to do the job they are assigned to do, I want that to be preempted. I want 1-1/2 megabits of that T-I pipe to be used for the application services that I want today. And this example, this lower-priority service, PSINet has actually been implementing with approximately 50% of its leased-line customers for over two years. They can make sure that their pipe is not swamped by this specific location.

Now, you as a customer may decide that your low-priority service is the Web — I rather doubt it at the moment, but you could — and PSINet can configure that for you. Again, [that's something] in operation on PSINet today.

Let's talk a bit about entertainment, because I think that on the consumer side and on the individual side this interactivity, this real-time Internet world, can be seen more clearly there. Obviously on the Internet right now there's tons of informal entertainment; there's MOOs and MUDs, there's Network Bridge, there's some uses of C-U-See-Me for entertainment, X-Trak, and there's a few LAN-based consumer games. Obviously there's surfing the Web, there's chat, and tons of informal entertainment, the entertainment that we all do in a different mode at home with our neighbors, with our friends, with our family, and for us.

I think the next phase for entertainment is going to be formal; it's going to be real-time, and people are going to spend real money on it. The slide shows and the home videos are great for entertainment, especially when you look at yourself ten years later — and in my case see how much thinner you were or how better-looking you were — all of these are true in my case! But think about what it is; however you still spend the money for the formal entertainment of going to the movies or renting a video, the same is going to be true on the Internet because it is going to be the home of the interactive or interactivity applications.

A clear, absolutely clear example of Internet entertainment is going to be gaming. Again, for some of you I don't think this is new news. Gaming on the Internet will be a 1996 formal reality, formal as in people making serious money with serious players, using games. It is going

to be driven by home PCs with modems. And conservatively, I think when we look at the numbers — which are a compilation of the citations on the bottom — in June, 1995 we had about 33 million PCs, and 10 million of them have Windows and modems. That's not to say that there aren't Macs, or that there aren't lots of other things; but I am just focusing on one piece of this pie.

In 1995 approximately one-third of all on-line users play games. If we take a look at 1998, which is not that far away, there are 57 million PCs — again, conservatively — in the homes in the U.S. There's going to be 32 million with Windows and modems; and again, in 1998, approximately 54% of them by that point in time having some form of Internet access.

So if we look at 1998, make some guesses about how much people use this, two hours per month is very, very conservative. Let's say they pay an average of \$2.00 per hour; the gaming industry, the network gaming industry, could generate \$600 million a year.

So what are the gaming parameters for the future? What is going to make me choose to do this as a kid, as a geek, as somebody who doesn't have much time, as whatever you are? One [reason] is that the gaming is going to have to be real-time and low-latency. It's going to have to be 3-D. It's going to have to be titles found in computer stores, not custom network titles as is the dominant form today. It's going to have to be multi-player; it's going to have to support some form of socialization. I think it's going to have to require real-time distribution of players' voices, and the person on the next continent that you're playing a game with should at least appear like he's in the house beside you, and in an audio sense like he's on the gaming deck beside you.

Now, I don't think this is necessarily anything new. If you consider what we let our kids do on the Internet today, where they have communications, and friends, and e-mail and whatever else with people on other continents, in other countries where their first language isn't the same as our kids', we are not too far from games with those other kids, games with our acquaintances, et cetera.

Where is this going to happen? It is going to obviously happen in the home; but I think it is going to happen at work as well — because who can stop the Internet? Who can stop the Web? Who can stop games? And I see a world where this is going to happen in the mall. The Bally's game, the game that's sitting there at your local mall, that stands alone and has got the joystick that you like that you put a quarter into, will soon be networked into this Internet gaming world.

Gaming [will be] the "killer app." I think in the last eighteen months *Spyglass*, *Mosaic* and *nauseam* have delivered a killer app called WorldWide Web browsers. Now there's going to be more killer apps, and I believe that one of them is going to be gaming. [This statement is from] the president of Odyssey: he says that entertainment is the 3,000-pound gorilla in America's living room. Information, the information that we currently do and browse with our Web browsers, is important to many but takes a back seat; and this reality comes through in all of their research.

Yes, I look for information. I subscribe to *The Washington Post*, *Time* magazine, *National Geographic*, whatever it is; but how many hours, how many days do I spend on pure entertainment applications, whether it be the TV, movies or whatever else, or Sega, Nintendo, et cetera?

PSINet is now tuned to do real-time, multimedia, multi-player, interactive gaming. Servers are now in place for gaming partners to use; guaranteed low-latency for gaming or any other application is a reality. And the technology for gaming is usable for other business purposes, obviously.

So in summary, superior Internet technology is needed to provide real-time Internets for business and entertainment purposes. Demand for Internet entertainment is on the rise, and

will materialize in a definable way in 1996 in the form of interactive, multi-player gaming. All Internet users benefit from the superior technology and experience provided by PSINet, and from our perspective PSINet is uniquely engineered and positioned to provide real-time Internet services today.

PSINet is announcing strategic partnerships today with M-Path Interactive and its network publishing platform for games, and has title partners which it has announced or will be announcing: a partnership with MicroProse, with its *Civilization* game; a strategic partnership with Borta, Inc., for its games and technology; and a partnership with Vocal Tech for its *InternetPhone* software for Windows.

And I think that's it. Thank you, ladies and gentlemen, for coming today.

KEYNOTES

CROSSING THE CHASM



SPEAKER

Paul Gudonis

Chief Executive Officer and President, BBN Planet

Paul Gudonis: Thank you, Bill. Good morning, everyone. I understand from Bill it's a much better environment today than Monday, even with the clouds and perhaps the drizzle. I did happen to meet with Eric Schmidt, who faced the conditions on Monday. He was quite gracious when I saw him yesterday. He said just practice your speech in 45-second bursts. If I sound a little choppy, it's because I have been rehearsing all night and trying to time it between the takeoffs of 757s.

I am going to talk about the problems of commerce on the Internet and talk [about] the chasm we have. I will credit Jeffrey Moore and his book on *Crossing the Chasm*. The chasm that we face as an industry is participants who fear going from primarily communication to electronic commerce.

To cover this topic this morning, we are going to start and review the Internet past and present, it's use as a communications medium and talk about how we cross the chasm in the future, and if we do, what happens then; and the Internet industry agenda that I would like us to consider and adopt as we go forward.

The first question I would like to bring up, will the Internet matter? Certainly there is a lot of hype, press coverage, where they say there are 30 to 40 million connected, a hundred plus million in a few years, and the important aspect, as you know, [is] any computer will be able to talk to any other computer, any person talking to that device, working with that device will be able to talk to any other device on a network anywhere in the world.

The significance to me is that this will become the data dial tone. It's what we take for granted in telephone service. I worked at Ameritech and at AT&T. We took something for granted, i.e., telecommunications. If you have an agreement on open standards, on a unique numbering scheme where any device in the world has a unique identifier, you can communicate.

Any person in the world can talk to any other person through this network. We take for granted I can dial a phone and in Germany it operates over the phone lines, and I am connected. As long as we can both speak English [and] German, we have communication. This is what the Internet promises for our computer systems and people that use them.

If you look at the past, present and future, and you look at the Internet, until recently it was primarily a network infrastructure: file transfer, networking, Gopher, run research, academic institutions, often the engineering group within corporations. Presently it's an electronic publishing media which has taken off at an astonishing pace, with the establishment of the development of the World Wide Web.

The ARPANET was developed by BBN back in '69. Here is a picture of the network that existed in 1971, connected primarily for research and communications applications. It was the following year, 1972, when BBN's Ray Thompson invented using the @ sign that [which] we are all accustomed to. Ray invented using that for e-mail. That's part of our daily lexicon in terms of using the Internet and now we look at Ray as the Samuel Morse of Internet. "Ray," we ask, "What was the first message?" "I forgot. I forgot." "Make something up."

Well, the infrastructure was developed by the National Science Foundation of the United States and then was expanded internationally. The regional networks, primarily out of research and academic institutions — NearNet, New England Network by BBN, MIT, Harvard, Boston University, Stanford being the core institution for the Bay Net area, Internet, a variety

of different networks opened up across the world to provide the user access to the Internet resources.

Today that picture has changed. We have national backbones, international links, Web sites, thousands of Web sites popping up all across the world enabling people anywhere to have access to rich multimedia on-line. Also all the major on-line services providers — AOL, CompuServe, Delphi, Prodigy — providing a gateway for their users into this rich electronic public media.

Businesses have realized the potential. They are now adopting the Internet and the Web to electronically publish product, information, brochures, catalogues, press releases and report price lists, order status, for example, but it's still primarily a publishing media. What I think is typical in the adoption of a new technology.

Let's take what we are doing in the past and port it to the new technology. Let's take what we are doing in publishing information in documents and let's bring it to the Internet, to the Web, and publish it on-line. It's the primary way we adopt a new technology. We did that with radio, television. Publishing revolves around the power of the Web.

In the Web site I can create a storefront. I can have it serve as gatekeeper for information databases, and I was very excited about that. You can also link by hyper-link to other Internet sites on the Web, and also you can start processing some transactions. It's a very rich new platform for publishing.

What I thought we would do is take the present day on some of the business sites on the Internet. For example, I have got to plan a winter ski vacation. Let's go look at Copper Mountain. You have an example of what the ski conditions, information about the various programs and packages that they offer. Perhaps your choice is a warmer spot, and Club Med enables you to take a look at their various resort properties: Stage One, publishing information about their resorts and packages, Stage Two is received, and these companies evolve to taking reservations, lodgings right on-line.

Sun Computer provides customer service. Likewise, Silicon Graphics publishes a variety of information and a lot of direct customer support. You can link yourself to your customer by providing on-line customer support. A recent customer, *The Boston Globe*, wanted to become the information source on-line for New England. "Take our existing content and enrich and enhance it and bring that on-line to thousand of users."

The key point is providing access to corporate databases. We hear companies say "I have started to publish information. The only problem is it's static. My business keeps evolving. My product changes. My inventory changes."

Now we hear companies saying, "I would like to provide access to order status, to transaction records and history, to product information that is constantly changing and bring that on-line." So we see companies taking an end-to-end approach, saying the Internet offers me a true global client/server network. If I have a customer anywhere in the world connected, by having a Web service — I have a firewall to protect my information system — but allow users to get access so that I can check on customer profiles, product inventory status. I hear that United Airlines is going to allow customers to have on-line access to check on reservation status. We are working with companies to basically enable them to put together this end-to-end approach, in taking their information out to their users globally.

Another one is Federal Express. You can download a piece of software via the Web to check the status of your package. You enter an order number, and it will go into the databases and in a period of time it will return with an order status. Wells Fargo uses the Web to provide customers with on-line banking information transaction history. You can go in through the site as an authorized user and get information about your bank accounts and financial transactions.

Another example, Dell Computer, a very successful direct mail seller of the PC. They do customer configuration. You specify hardware, the software. They customize the package for you and ship it to you. It may take a couple days to have that happen. You are anxious about the status of your order. In the past you had to call an 800 number and a customer service representative would tell you the status of your order. Now Dell has a Web site so that you can actually go in, in a self-service manner, and check on the status of your order. A spokesman for Dell said traffic jumped dramatically into the Web site for this purpose, and the economic analysis, the business case is very strong. If they have to provide the answer by a customer service rep, it costs them about \$2 per transaction: to answer that phone, to pay for the phone, the staff to be able to check on the status. It takes about \$2 per customer inquiry, but by doing it on the Internet their cost per customer inquiry is five cents.

So that's what companies are doing, and we are helping essentially define the community of interest. Each company is the hub of a whole set of players, of customers, of prospects, of dealers and distributors, of trading partners, PR firms, banks as well as law firms, and others, and we see the Internet as really the opportunity to link all of those entities within your community of interest and improve communications, tie yourself more closely together on a world-wide basis.

So businesses have discovered that they can develop closer relationships with their customers and build brand awareness. I think what Dell is doing is part of a whole self-service trend that has been going on in this country where we are pumping our own gas. Take a case like the banking industry. The ATM machine enables us to do self-service 24 hours a day, seven days a week. You don't have to wait for Saturday morning from 8:00 to 10:00 to go to the bank to get \$100 out of your checking account. You can do that any time, and it enables the customers world-wide to have access to your information that you want them to have any time in a self-service mode. That enables dramatic cost savings.

The Internet is also emerging as an electronic marketplace, a place where we come together to exchange money, goods, services, information, and the early adopters have used it for publishing catalogues, price lists and promotions, and even have started to take orders.

One of my favorite sites, Godiva Chocolates, they now have Holiday Magic. You can order a box of chocolates on-line, or L.L. Bean. We just worked with them to develop their new electronic on-line presence. Now you can tour L.L. Bean's product operation on-line. The Internet Shopping Network, it's been very successful in creating a presence to market a variety of goods and services, running a variety of daily specials. FTD on-line. It's diversifying to an on-line mall. Even Pizza Hut. You can pull up a menu, enter a selection. You do have to put in your name, street address and your phone number so they can call you back. Right now if you put in an order, they call back and say, "Mr. Gudonis, did you really order 25 pizzas?" That's one of those security/transaction integrity issues that we face before we go forward to true electronic commercialization. Pizza Hut calls you back. We just have to work around that problem. We have got to collectively solve it if we are going to use the Internet for secure commerce.

Let's look at what it's going to take to cross this chasm. Today we are using it mostly for communications, product information, advertising, news, articles, frequently asked questions, electronic publishing on-line, commercially defined financial transactions, buying and selling, having an electronic shopping agent, having an RFP on-line accepting proposals from vendors, doing order entry, contracts being issued as well as purchase orders, all on-line.

Now to cross this chasm we have got five major challenges in front of us. The first one is security. The second is speed, reliability, directory services, and then payment systems. We need to work together as an industry as well as companies that want to use the Internet for commerce to build this bridge. I would like to go through each one of these.

If you look at security. You want to take orders over the Internet. Our buyer is going through the Internet to get access to an on-line information database. The first job is authentication of the actual buyer. As it goes out across the global Internet, confidential, that the message is not viewed as it crosses the sets of 60,000 networks currently interconnected as the Internet. When it arrives, it arrives with integrity as it reaches the server.

We need authorization. You may have sets of only your salespeople, for example, to have access to it. You have a method for authorization only for those sets of users. To get into the rest of the system, you have to go through a firewall. Then there has to be a process for non-repudiation. If we are going to use the Internet for commercial purposes, order a thousand widgets, first I send you an electronic order. I am running my assembly line, and they don't arrive. I call you. "What happened?" "Well, I never got the order." We need a method for non-repudiation. I sent you an order, and I can confirm that in fact you did receive the order.

Finally, what we have to have in place, end-to-end audit trails so we can track from the start of the transaction through its fulfillment that it happened. Because the Internet is evolving, it's immature. All these need to be developed.

The Internet industry is developing security solutions. Over 100 organization have come together to identify issues like the security issues and develop pilots to try developing solutions. Firms led by the Bank of Boston, Chase Bank, Chemical Bank, Bank of America and the Financial Services Technology Consortium working on how we implement effective security in electronic check transfers.

Last month we demonstrated the first transmission of a check on a demo basis. How do we now make this part of the institutional structure of the financial services industry?

The next topic we need to address is speed. We need faster connections. Two major technologies and players we're working with [are] ISDN, so we have digital tone into the home at speeds of 56, 128 kilobyte. [And] the cable companies are excellently positioned with a broadband pipe into the home for video programming. They've become a natural ally of ours in being able to provide LAN-type services connected by cable infrastructures. We have been working on both ISDN and cable issues to be able to use the infrastructure in place for Internet access.

If I am going to use the Internet for commerce at home, it has to always be on. Back to Pizza Hut. Every couple of days in my home the younger natives chant "pizza man, pizza man, pizza man." While they are chanting, I go to the den, turn on my machine, boot it up, dial in to an on-line service, log in, go to a search, look for pizza, find a pizza place, put an order in, wait for a call back; or I can go pick up my telephone, dial a number, and order a pizza, and it's there in 20 minutes. We need the ability to have a network appliance, the PC, in the home, in the living room, in the den, in the kitchen, it's always on like our toaster, our microwave oven, our telephone is always on. There is always power there. Unless we have that, we will see a limitation to people's adoption of the Internet.

On the network and business side, firms like ourselves are investing in tremendous capacity additions through the Internet backbone. Internet BBN was just awarded a contract by the federal government to design the next multi-bit router. Then many of our business customers are purchasing at least T-1 speeds, one and a half megabyte connections to the Internet for their multimedia commerce services. Some are now going up to speeds as high as T-3. The end result is no busy signal. There's nothing more frustrating than that, because the pipe or server are not big enough.

Web site availability, higher throughput, mirrored sites at different parts of the Internet so traffic doesn't congest to one site, better system management, end-to-end audit trails, time stamping. These systems will mature.

Now we are working with AT&T on a new nationwide network infrastructure. Our network operation will utilize a high-speed nationwide backbone with over 500 local points of presence for companies to connect to the Internet. We are significantly expanding two hosting facilities in Cambridge as well as in Palo Alto. So we can provide customers with high bandwidth access, to be able to have access to mirrored site adapters so that they can enable their customers to get access to their information databases on-line.

Directory services. Today how do I do that? I have to either know the URL — it comes from UNIX. It's rather cumbersome for the typical user. We need to be able to do a point-click type of approach. We need voice input, so I can speak to my PC and find my Web site on my location anywhere on the Internet, for example, for American Airline. How do I pay? Credit cards, slips, cash, paper checks, an electronic wallet. We are working on part of it. How do we do electronic funds transfers over the Internet.

What this will lead to is really a multipurpose network in the future. Whichever industry you're in, you can use the Internet for a variety of functions: advertising, selling, customer service, just-in-time supply, distribution of any types of products that can be bits, e-mail, of course, and video-conferencing over the Internet, which we have demonstrated.

As the Internet then evolves — if you remember that map I showed you of the ARPANET, that thin line connecting a few of the lines, it becomes a multi-layered infrastructure. There is a network infrastructure. There are secure electronic commerce services. We see manufacturers, part suppliers, consumers all plugging into this rich network which enables commerce as well as the public communication services as well as e-mail.

The Internet offers a lot of ways once we solve some of these other security and transaction problems. It's standard-based, world-wide and, importantly, it's multipurpose. I won't need a separate network for video commerce. I don't need a separate Internet to connect my EDI systems to my suppliers. By hooking up to the Internet, I will be able to do all these functions of electronic commerce in one cost-effective network.

Well, so it depends where you are in the food chain. If you are a manufacturer or a services firm that has something to sell, if you are a distributor, an agent, we see an emerging battle between different levels of distribution channels where manufacturers are saying I want a direct link to my consumers with lower cost, global reach, and small firms on the Internet look as large as the big ones. Consumers, whether looking for businesses or government or household items, should find lower prices and more convenience by being able to shop from the business or at home and go directly to manufacturers. So if you are an agent, you could look at the Internet and say I am an endangered species.

Ordinarily, we will see the channel fight back and actually capitalize on this opportunity as well. We see travel agents, retailers saying "I have customer intimacy. I know my customers. I have been serving them for years. I want to create a long electronic structure and put my suppliers at the mercy of me." I kind of feel like an arms merchant working with the superpowers as they formulate their strategies for dealing with this emerging infrastructure.

Whatever your business — insurance, banking, retail, travel, manufacturing — you need to look at what does this mean to your business and to conduct an Internet impact analysis.

There is an upside to this. You can achieve more revenue having global reach, improve customer service, lower your costs, or there is potential loss of franchise, loss of market share if you ignore it to new competitors who will capitalize on this infrastructure. My point is you can't ignore it. I suggest that you do an impact analysis to see what does it mean for my industry.

In the media industry, for example, television relies on advertising revenues. That means somebody has to be watching TV. If everybody is surfing the Net, they aren't watching the TV. Industry must look to how can I complement my brand.

This is a clip from *The Tonight Show* with Jay Leno. There is a live clip every day from Jay Leno's monologue. Here is a network provider who capitalized on the Internet rather than potentially losing customers.

What's the impact on news channels? Another customer, Turner Broadcasting, puts on one of the most popular sites of the Internet, the CNN on-line site. What if anybody can broadcast the news world-wide. What is the value of your franchise?

Earlier this year there was a tragedy in Japan. There was an earthquake. Before the international news crews could get there — it took a couple of hours to fly there with the crews — students from the University of Kobe on the Internet started to publish information world-wide. It actually had digital photos on-line well before the major news agencies got there.

In addition, they opened up a service. If you were a Japanese family in the United States worried about your relatives, you could send an e-mail saying "Do you know something?" "We will go look for them." It becomes a truly interactive medium. In the news business look at what type of opportunity that has. There was a recent volcano in New Zealand. You can get a picture of the current status of the volcano.

I spoke to an executive at the National Association of Broadcasters recently. We talked about two models of the television industry. The old model that you had, which consisted of an expensive studio with expensive gear and expensive cameras. You had to have a TV set which became a primary infrastructure. The question is what happens if anybody with a cheap camera gets on the unregulated ubiquitous Internet? There's a PC in millions in the home. What does that mean for your industry if you're in the TV business?

Well, as we go forward, I would like to address together a set of topics around public policy as players in the industry. Currently in the United States we have telecommunication industry regulation proceedings. The Internet is not regulated. We have to have fair competition. What is a copyright is becoming a big issue. Also, a lot of our regulations around specific industries have grown up around geographic boundaries.

As an insurance company, I'm allowed to do business in Massachusetts. Now, with the Internet, I can distribute services throughout the United States, enroll customers globally. How do we harmonize so I can capitalize on this global infrastructure? A variety of companies developing the encryption techniques, to have global commerce, have to have truly global agreements on the ability to export key technologies.

We are going to face redefining personal privacy. When everything is digitized, when I set my alarm, my coffee, what I buy at the doughnut shop, how many miles, who I talk with, who I communicate with, what Web sites, what transactions I do, once it's all digitized, it's in somebody's database. The question is what's the role of privacy? What as a society do we want to establish as privacy standards within the United States?

For example, I did some work with the telecommunications industry in Germany. We had modified our billing system because in Germany you are not allowed to put on a bill the last three digits of a phone number. The last three numbers are 'X'ed out. What do we as an American society want for personal privacy? There is First Amendment rights, the right of free speech, and censorship, responsible use.

Yes, I can say anything I want world-wide. What responsibility do I have for accountability for what I say? And do we as an industry, parents, teachers, for example, to be able to give them some control over what our children have access to.

Then as an industry, our growth has been ruled by open standards, by collaboration where companies are coming together with commerce, financial services consortiums saying let's work together to adopt a standard so things may flower.

We have to continue this spirit of collaboration, make it easy for consumers, especially people who are technophobes. People are still afraid of using a PC. They are afraid of trying to

set the VCR. We must create trust in the infrastructure so that one feels comfortable as a chief information officer to put my information on-line, take orders, and trust as user to put in an order.

In any new technology revolution like we are seeing with the Internet, there are unintended consequences. We have to think ahead, what could possibly happen as we introduce and capitalize on this technology.

I happened to pull out some predictions from the past. I will read those for you. Housekeeping is such a simple matter when organized and done over the wires. A morning's tiresome shopping can be done in 10 minutes in the comfort of one's own home. There is so much more time for pleasure and recreation and things that are worthwhile. This is a telephone company's ad in Philadelphia in the year 1905. It's talking about the benefits of the new technology called voice transmission.

Those that are involved in the technology and implementing it have got to remember it's really a people thing. That the Internet will affect how we learn, how we work, how we play, entertain ourselves, how we shop going forward, and how we develop our relationships, how we form new relationships, how we link ourselves with our family, whether they are children off at school or grandparents around the globe. Keeping that in mind as we go forward introducing this wonder, Internet technology, to the world.

Thank you very much for giving me a few minutes of your time to talk about how I see a crossing of the chasm and making a world-wide infrastructure. Thank you.

INTERNATIONAL COMMERCE INTERNATIONAL ASPECTS OF INTERNETTING



SPEAKER

Czeslaw Grycz

President, The Wladyslaw Poniecki Charitable Foundation, Inc.

Czeslaw Grycz: Welcome to this session on the international aspects of Internetting.

My name is Chet Grycz and my colleague is Laura Fillmore. We are going to be the duo that gives you the “Chet and Laura Show” this morning. We’ll talk a little bit about both of our experiences on the Internet, in terms of international issues.

To give you a little bit of background, my take on this is going to be mainly from the nonprofit sector, with quite a bit of experience in Central and Eastern Europe, and some other Third World countries.

Laura is going to be talking — from her perspective — on a more commercial side of things. So, with that as an introduction... Laura will introduce herself some more as we get into that.

Let me tell you a little bit why I can stand up here and tell you anything at all. It’s mainly down at the bottom here, and it says, “burned fingers involved in enriching experiences.” Indeed, all these fingers here have been burned in a variety of experiences in international work: in Romania, in Hungary, the Czech Republic, Slovakia, Poland, Bulgaria — all of those regions. Also in Mexico and Latin America.

Those are the reasons why I can talk a little bit about international issues. I have however, also done some work at the University of California in terms of large-scale electronic publishing projects. Those are extremely important to people in the Third World, in terms of access of information. There’s a considerable overlap in the kinds of work that I was doing at the University of California and the kinds of things that I do under the auspices of the Poniecki Foundation, which is a nonprofit foundation working mainly in Third World countries. We deliver Internet services, lectures and workshops, and we help librarians get on the Internet and begin to understand what it’s like to work and live in a digital environment.

I’m going to cover some Internetting issues today, things that we have learned from our experiences. [They will] probably be of use to anybody going into an international venue or interested in working in either in the commercial aspects or in NGO or governmental work.

There are a number of things that I think we’ve learned that we can tell you about. I’d like to give you a case study about a project that we initiated under a U.S. aid grant. It resulted in a ecological library directory of considerable size and scope. I think the process of making this directory on the Internet, and mounting it on the Internet, is a useful paradigm for many of you. So I will give you a little bit of detail about that.

Then I want to draw some conclusions and make some recommendations. What I’ll try and do is put on my predicting hat and predict a few things, and then you can come back a couple of years from now and say, “well, Chet you were wrong about this, you were wrong about that, you were wrong about that.” It’s also nice for me to see where things are going and try and give you some idea whether there’s any profit in this business at all.

The components that we’re going to be talking about are... there’s a whole batch of practical issues in terms of the wiring of the global information infrastructure, and the issues having to do with the different bandwidth in different countries.

For example, in Romania we’re talking about a country that has an entire bandwidth trunk line, serving the entire country, of 56K. So if we’re talking about WorldWide Web

development in Romania, you'll see that it's probably not the right place to be doing that. You'll find that there's a very slow response.

On the other hand, one of the things that you'll also find in countries that are impoverished in terms of the capital resources that they have is that they are enriched in terms of their theoretical understanding, and in their creativity.

When we were giving a workshop for about 65 librarians in Ploiesti, Romania, the day that we arrived there the trunk line went down. There was no Internet access at all to Romania. While I was spending all night trying to figure out how to make overhead slides out of pieces of cellophane, the people were up in the central office calling all their friends, among whom was the local TV producer. They convinced the TV producer to aim his satellite in another direction and we beamed down to Vienna and suddenly we had virtually T-1 speeds coming into Romania across the satellite. Everybody was quite pleased with that. We had a very successful workshop. It shows you the creativity and the skill, in terms of understanding the theoretical issues, which are oftentimes far advanced to most of our own computer scientists. They have it sort of cushy because they've got all of the material around and all the available issues.

Extending the Internet is important. This is the world's largest communication effort. It's probably the largest building effort that human beings have ever undertaken; it's an extremely important issue. I don't have to tell you this — it's sort of like talking to the choir — but when you really understand the fact that we have the capability of synergistically working as a world community for the first time, you begin to understand what in the '60s was a very popular book written by a French priest, Teilhard de Chardin. He coined the phrase "neosphere." It always seems very emotionally satisfying to think of his concepts of raising human consciousness. In fact, as we start communicating with one another across international lines and across cultural lines we do, in fact, begin to experience synergies that are quite different than they are in local areas.

One of the things that we find in Internetting and in doing commerce — certainly in terms of technological investments by human beings — is that it's a two-edged sword. On the one hand you'll find me reinforcing a fact that the principle role of the Internet is actually to build community. When you understand that this whole infrastructure exists, [you'll know] it's not about wires and hardware: those things are changing all the time. There's optimization of different kinds of functions on various platforms. In fact, the TCP/IP protocol and the leveling out that commits us to be platform independent is a way that sort of buffers us from the hardware issues. Although they are important, they're not what the Internet is all about.

Similarly, when you take a look at the software, lots of capabilities are being made available because of software and programming advances. It's not software that this is all about, either; it's really all about communicating and people-to-people contact.

When you think of community building — you understand that you have a community of some 300,000 people, let us say. As a kind of threshold, you actually have enough diversity to be able to build systems that will help encourage community life. You have diversity; you have contributions; you have networks that allow communication — and suddenly you have something that can enhance that community's well-being.

On the other hand, if you have a community of 3,000 people, the Internet is a very useful excuse to get out of that community. There's a concern. I'm going to be pointing to the positive sides of almost everything that I see. I want you to realize that on every positive side there's probably a negative side just as well. **We think of the Internet as community building, [but] it also can be community destroying.**

Globalization can take over communities. There are some interesting concerns about that. Similarly, as we talk about the geopolitical issues, the boundaries of international borders are going to disappear and get fuzzy as we have more and more traffic going across the Internet and across electronic systems. That will tend to minimize nationalistic fervor; yet, on the other hand, in many parts of the world right now nationalism is the kind of identity issue that is an extremely important component of growth and evolution into free market society.

So there are lots of very interesting issues here. I think the important thing, of course, is that this is a bi-directional communication medium. All of these issues — whether they are the ones that we like or the ones that we don't like — are susceptible to a lot of conversation. Americans, in particular, are not used to that. We like to be dominant, we like to give the truth to people. In a network environment, we have to be much more willing to give and take.

It was interesting to me, and probably to many of you, the kind of flurry that came around the IPO that Netscape announced and went through about a month ago or so. What that told me is that access is really what it's all about, because Netscape is an access vehicle. What we're interested in is the excitement of getting resources from remote locations — a whole variety of software packages that are integrated into one. In fact, that wasn't the issue: what was at issue was our ability to get that information. You see this in international work all the time. There is certainly a barrier in going through the kinds of software/hardware issues, but all of these are secondary to the fact that we want to get at resources; we want to have a vehicle to talk about the resource, the information content, the pride that we have in our local communities and our local skills and capabilities.

If access is the first key to understanding the Internet, then listening is certainly a corollary to that. Again, it's not a particularly American trait. And as we think of international work we have to develop new skills in addition to the ones that we have in terms of running business and handling things in that way.

The geopolitical implications are serious ones. In parts of Central and Eastern Europe, for example, there's a considerable resistance to the idea of the Internet. There's a resistance to the implications of what it means to have a society well-connected to outsiders. These are remnants of a command-driven economy. It's also a kind of fear of influence from the outside, and it's compelling because of the way that it's brought forth to a citizenry; it overtakes the local needs of that community to work within itself.

I think that there are dynamics about geopolitical issues that we don't fully understand right now, and we just simply need to be sensitive to those. Those are extremely important and delicate issues. I can actually even bring that down to an example in the United States right now.

There are two Senate bills and a House bill having to do with lewd, obscene and indecent material on the Internet. Now, it's bad enough that we don't know how to define obscene. Now we're adding the words lewd and indecent in these bills, which are even more [ambiguous]. We appear to be thinking in Congress that if we establish local legislation we're going to solve a problem. That is, in fact, an issue for a global environment, which we're not going to be able to control.

What's interesting about that process is that it is taking place in the United States. It's a politically correct kind of thing to do. It's a politically safe thing to stand out in front of a constituency and say, "we're against pornography on the Net" and yet it's sort of a silly approach to the whole aspect.

It's a demonstration that even in the United States, you've got geopolitical issues that are going to be different from the technical issues. [These are] different from the community-

building issues and different from the communication issues. Those political issues will sometimes be at loggerheads with what's going on in the Internet. Increasingly, as you look at the Third World countries, you'll find that conflict going on, too. It's nice to know that it's not always in their ballpark, though; sometimes it occurs in our ballpark as well.

[Here's a] fitting example of consensus decision-making — again, I won't spend too much time on this because you know that the Internet is a wonderful experiment, one that has no governing body. It's a decision-making process that is consensus-making. The issues that come up go to the engineering task force; the protocols that develop come from a wide variety of feedback. There's problem-solving with a variety of experts. What all of this suggests to me, however, is that it is the involvement of people that provides commitment.

We're finding that in many areas in which we're entering and saying, "here, we need to develop the Internet," that the way that you do that is to actually empower individuals who have some authority, who have some vested interest. It's their involvement that generates that commitment and then carries the ball further.

Again, there's this tendency for all people to walk in and say, "Look, I've got the solutions for you, do it my way and everything will come out quite well." In fact, we're finding in the community-building aspect, the deployment aspect and the implementation aspect, that's not a very successful approach.

Far more successful is to find the people who are really vested in improving themselves or improving their stature in the community, or wanting to accomplish something through a communication media such as electronic information. These are people who want to provide access to information for a constituents' group, to be able to have peer interaction — let's say for legislators and various counties with other libraries of legislative and legal materials — somebody who has a vested interest in accomplishing something.

You empower that individual by making available the tools, tool sets and capabilities — showing them the way. Suddenly you have maximized your effort because you have a number of people working toward the same goal. There needs to be a preparedness for commerce in every marketplace that we're reaching. And that preparedness, in many countries, is colored by the sociopolitical issues that have been a part of that cultural background. It's also colored by the fact that there's not as deep a penetration of computing power in the general populace as there is in the United States.

Even here, I teach at the University of California at Berkeley but I can go off 100 miles or 45 minutes into the Valley and I can be in communities that are not at all wired. So there's a dichotomy there in [terms of] the franchised and disenfranchised.

I have a good example about that where my brother-in-law lives up in the Mojave Desert above Bakersfield. I just recently established an ISDN connection in my home office, so I've got speed back and forth. It's really a wonderful thing. He came down and he and his wife — who is an attorney from Yale — do home schooling. They were very impressed with this and said, "Well gosh, you know this is great, can we get it?" I said, "No problem. This is ISDN, Pac Bell — they've got it all over the place. All you do is go back to Bakersfield, go back to where you are, call the phone company and find out when they are going to have ISDN in your area." 2017! I was impressed that they even gave him a date. But 2017? There's that issue of market preparedness.

You have to understand that not everybody, in terms of the message that you're going to be making, is going to be able, first of all, to receive that message in any coherent fashion [whether] we're talking about Web presence, or even if we're talking about network presence in a lower level of character-based FTP, or links, or anything like that. There's also the awareness and the comfort level of dealing with technology as a consumer. That's not yet developed, even in the United States. It's certainly not developed in some of the other

countries. The local standards, copyright and censorship issues are very similar to the ones we're talking about here.

Implementing bureaucratic government also has to do with a couple of other related issues. They have to do with confidence in one's self and understanding who I am and where I am, what my business is about — and being able to give and take with other cultures. Again, it's a very important issue to find out how business is conducted in different countries.

There are lots of nuances to the governance of business in different countries, and certainly in the Central Eastern European area. Unless you have a good guide, you will find that your money is going into a sinkhole. There [are] as many different creative ways of taking your money away from you as you can possibly imagine. It's a natural evolution of supply and demand: dollars are in demand, hard currency is in demand, and if you walk in naively thinking that you're going to be able to conduct business on the same level playing field that you do anyplace in the Western world, you're going find that that's simply not true.

People will very happily take advantage of you, and they'll do that with a smile on their face. They'll do that with such skill that you won't even know that you've lost your money until you leave. Now, I'm painting a bad picture, but what I'm trying to show you is the fact that there are different cultural behavior patterns and different cultural rules about how one does business in countries that are struggling to evolve in a free-market economy. There is a much more aggressive tendency to use those to personal advantage rather than communal, joint effort advantage. You've got to be sensitive to that.

There's also an issue in terms of collaborative tool sense. Almost all the tools, as you know, that were developed on the Internet were based on the needs stretching back to the ARPANET — where we were actually looking for remote job control and collaborative work among scientists. So the tools that developed were in fact related to communication tools, one-on-one or one-on-many. They were also related to remote job control. There are not very many tools developed that actually allow full collaborative work. Lotus and Lotus Notes, for example, seems to be moving in that direction, but on the Internet. you're not going to find very many tools that allow a good deal of collaboration.

That's critical, because you'll find that although the network community is certainly an English-speaking community, you nevertheless need to understand that there are different levels of comprehension of English.

There was a great article in the *New Yorker*. Some of you may have read about a Czech automobile firm that had Japanese workers and managers involved in it. They decided that the lingua franca, which I sort of enjoy, was going to be English. So the lingua franca was going to be English, and the Japanese, with their broken English, were talking to the Czechs with their broken English. You can imagine that there was something lost in the translation.

So in terms of very many of the e-mail messages that I exchange, for example, in the countries in Central and Eastern Europe, I tend not to react to them right away. I want to listen to them reverberate in my mind a couple of times because there are times when I'll get a message and it will be really offensive. I mean, it will be either hard-nosed — or somehow they've missed the point.

As I read it a second and third time, I try to listen to the accent someone may be writing with. I suddenly realized that some of my impressions were [based on] a particular understanding of the English language, and certainly levels of the written language. When we're speaking back and forth, we've got all of these body language images that help us in terms of communication. When we're using only written ASCII text — plus maybe smilies now and again — we don't have the full richness of the palette by which we communicate. Those are issues as well.

Providing mechanisms for free speech is related to the fact that this is what the Internet is all about. It's also related to the fact that we want to have a market area that is prepared to deal with this. So, we have to have more people connected, and more people working. It turns out, as I mentioned earlier, that in many countries that's a forbidding and negative aspect of Internetting. They're not particularly anxious to encourage things.

As a matter of fact, we've found that you have to work through the governmental agencies which are just as — in our case — very bureaucratic. They smile and say, "yes, yes, yes" but in fact, nothing happens after you come back the second year and the third year. So you've got to go through that process so that people can understand what you're doing. You also have to go through institutions.

We've been doing a good deal of work with the technical universities in each of these countries — helping them communicate with one another, finding alternate paths to get to various Internet drop-off points — building the network itself. It's amazing how important that is; it's also amazing how one individual can make a big difference.

And in the case that I told you about, the city of Ploiesti, the fact that there was someone who had a vested interest in making sure that they didn't have egg on their face by having 65 librarians with no Internet connection — and being able to use local creativity to come up with a satellite connection to Vienna — that's great. The more capabilities in terms of access to the WorldWide Web and the global Internet, the global infrastructure, the more powerful the ability for that network to function under all kinds of duress and all kinds of restrictions.

When you're working in Third World countries, and when you work especially in the emerging democracies, part of the job is to create linkages wherever you can. [You need to] help people make those linkages. So, we do that through institutions. We also do that through non-governmental organizations. There are a number of environmental groups, for example, who have set up bulletin boards and who have set up lists of one kind or another. We try to channel whatever foundation, money and support we can to get those people to become Internet service providers. That's useful for society, it's useful for the culture of the Internet, and it's also a preparatory step to working in a commercial environment. Mentoring on the Internet is, in an international context, extremely important. And mentoring is an activity that we should really understand.

[There's also the issue of] building communities. One of the things that people always talk about is how many users are on the Internet. We've been using the number of 40 million; there was recently an article in the *Chicago Sun Times* that said it's only 30 million. That's because a million people have multiple e-mail accounts, and you discount this. So it's only 30 million.

Well, 30 million is an unbelievable number. One of the problems, in terms of businesses, is that businesses look at this 30 million and they say, "gosh, if we only got one percent of this, then we'd be in gravy." And, of course, there aren't any techniques — or any acceptable techniques — to reach those 30 million.

Even if you could, what we really need to understand is that it's probably a million groups of 30 people that are really united in these on-line communities. That's good enough, because one of the things that happens on the Internet is that you get niche groups going. As a matter of fact, the commonality of interest is part of the thing that's of great interest to a business or a commercial venture that wants to market something. It's the self-selection that makes it valuable.

We have to think in terms of the fact that it's not 30 million users, it's in fact a group of communities that we can actually participate in and involve ourselves with. The real need for collaborative tools is particularly evident when you try and do anything in terms of marketing.

You must understand that in terms of running a business and conducting business on the Internet, especially in international venues, it builds entirely new conditions under which we can do that business.

First, it can no longer be partly because of the communication, partly because of the evolution of business, partly because of the understanding of world economic flows and inter-relatedness. It can no longer be an exploitative kind of an effort. We can't take our electric toothbrushes and send them down to Latin America because we can't sell them in the United States. It has to be a win-win relationship.

There's plenty of opportunity for us to strike joint ventures and win-win situations with people if our mind-set is that we want to collaborate with a group, and come up with something that helps them at the same time that it helps us. Those are the businesses that seem most often to succeed.

It's a mind-set that we need to develop for ourselves. The basing of information on open systems is something, again, that we've learned on the Internet. It probably comes as no surprise to you, but it's obviously a very important ingredient in doing business. So as you start working in a system that in terms of advertising — you know the changes that the WorldWide Web will have in terms of advertising — we realize that advertising itself can't simply be titillating.

The example I use in my classes is the Jeep ad on top of this rock in the middle of Utah. What's this Jeep doing on top of this rock? How could it get there? There's no road; you've got this helicopter that drops it down there. What's that for, is there any information in that? Is there any content that is really worth anything except to grab out attention? Not much. That might get still some play on billboards and on print magazines, but in a WorldWide Web environment or an on-line environment that's no longer a satisfactory approach to advertising.

What you want to understand is that it's an information system. You've got to be able to back up whatever titillation you have, whatever attention-grabbing issue that you've got, with a fact sheet, with a data sheet, with user information, with various evaluations and so on. The business of advertising and the business of marketing has to be much more open and much more information-rich than it has been in a print environment. And that's an extremely important issue.

"Cruising the market" is always something that amuses me. When I talk to U.S. businesses and Western businesses, they're saying almost always that there's this tremendous untapped market out there. That's what we want to get to.

When I go to Central and Eastern Europe, their answer is, "Boy, if we could only tap into the U.S. market, all our goods will sell." I think there's a real challenge here to understand that, as well open ourselves to reaching outside markets. There's going to be incoming access to our markets as well, and probably that's going to be a bigger one. So if you really are going to want to make it big in business, go over to a Third World country and start a business there. Then you can tap into the U.S. market. We're generally thinking in the opposite direction, if we're thinking "if only we can tap into this emerging market that's out in these developing countries."

All right. I'd like to now turn over to the second part of my presentation. It has to do with a grant; the Poniecki Foundation was a subcontractor. It was a U.S. agency for International Development Grant administered by the University of Minnesota. What we wanted to do was work together with environmental libraries in Central and Eastern Europe. The task before us was to help those libraries support the system of providing information to all of the constituents and their communities that needed environmental information.

It was a very interesting challenge, because the libraries in Central and Eastern Europe were not able to collect information on environmental matters over the last 40 years, or if they

did collect that information it was not in their best interest to make it available to the public. They were supposed to act as repositories and were, in fact, supposed to hide some of this stuff.

There is a whole mind-set that we had to change. In addition to that, we had change the whole understanding of what the transition is to an electronic environment in which access, not collection, is the issue for librarians. So this is very similar to business and enterprise as well, where you're talking not so much in terms of inventory and product sales as you are in terms of service and enhancing community work.

What we decided to do was to get the people to work together on a directory that we compiled entirely across the Internet. And so we called together representatives from six Central Eastern European countries; they met in Warsaw, Poland and we gave them some Internet training there.

We asked them to go back to their home countries and start working on understanding how to develop some Gopher databases, and also how to define the structures of the fields of information that they were to be collecting. [Also we asked them to] begin finding out where the repositories of environmental information were and to meet with us again in Bratislava, Slovakia a year later.

A year later we gathered all those people again. We repeated the process, but this time we started them working across the Internet delivering data. It turned out to a database in Vienna. In the process of doing their work, they began to understand what it meant to be communicating electronically, what it meant to be able to deal remotely over long distances as if you were sitting right next to one another, and what it meant to collaborate across nationalist bounds.

I must admit that one of the things that discouraged me about this project at first was when we sat down with the Czechs and the Slovaks. They speak the same language, virtually, and they can understand one another, but they sat on opposite sides of the room. They wouldn't talk to one another.

We had all of these difficulties in terms of cultural preparedness. Again, the point was that we started with a simple and rather insignificant process. In some senses, who cares about this directory? But in other senses, it was a task that was complicated enough that people got invested in it. So suddenly you found librarians empowered by the ability that they could work together on building a common product.

Then they mounted that product so that lots of other librarians could see what they were doing and be able to participate in building the database. I think that's a very good model. The idea is not to walk into a environment expecting total preparedness, not to come in saying, "here are all the ways in which you have to understand things," but come in with some empowering tools. [Then you] allow the human adaptive process to take the time it needs in order to get used to a new environment. And the electronic environment is a new one.

What was interesting in this "learning while doing process," building the eco directory, was two things. This was an U.S. aid grant. We also cooperated with the Mellon Foundation. It turned out that none of us had developed any kind of an exit plan.

One of the things that happens as you bring the Internet to new communities is that you raise expectations. Suddenly there was a raised expectation that there are going to be lots of things, lots of support and lots of on-going systems that are going to be provided to people. In fact, we didn't have the resources to do that.

And so, late in the five year program, we ended up by saying, "Well, one of the things we need to do is establish a sustainable body." This could very easily be a commercial Chamber of Commerce, or it could be a group of businesses in a particular industry. In our particular case, it's the International Organization of Information Specialists, the IOIS.

The idea there is to pull together some of the technical people at the technical universities, libraries, newspapers and Ministries of Information and bring them together. Suddenly you find that simply doing that is a big thing. As a catalyst who has the ability and the convenience of dealing with electronic information all the time — on my desktop, wherever I travel and wherever I speak — I take that for granted.

Then suddenly, when I go into another country and I bring together partners who I think are natural partners, it turns out that they've never spoken to one another. Those are totally separated and isolated instances.

The catalytic importance of this, and of doing business, is very important. But the business of establishing something sustainable that can outlast your particular investment is also important. When you do that there are a lot of surprises that come up. One of the things that came up was the realization, within the region that I've just been talking about, of a need to develop a new school for digital information. I'll come back to that in a second. This is obviously something that we didn't think about and wouldn't have suggested; but because there is such a collaborative work effort there we ended up developing that.

The lessons from the library project are several. The infrastructure issues — we really have to take those seriously. Not everybody has full connectivity, not everybody has continual connectivity. We're talking about all kinds of legacy systems that are very old, rather than workstations. Just understanding those differences is important.

The preparedness and commitment of people is something that has to be nurtured. It's one of those things that's like emotions; I can be angry and you may say, "the reason you're angry is da- da- da." That doesn't immediately dissipate my anger. An emotional life has its own way of playing itself out. Certainly in preparing and developing systems, in terms of electronic information it's similar. It's a brand new thing to many international venues.

There are behavioral patterns that are also important. One of the things that we did is set up a number of discussion lists for these groups to talk with one another. It turns out that nobody, for the first year or so, used those lists. The only people posting information were from the U.S. and the U.K.

When we got together at meetings I would rant and rave, saying, "You're missing the idea here. These are really wonderful communication tools, why don't you go ahead and use them?" Still, nothing would happen. Then it was during break time. I'm having a beer with someone at dinner, and they're saying, "In the culture that we've got, there's a respect for authority, so there's no way that I'm going to come up and say, 'here's what I'd like,' because after all, you are the professor and we're the student."

I wouldn't have dreamed of that being a real issue in terms of social communication, because when I teach at Berkeley I get students yelling at me all the time. But there's a greater respect, a greater hierarchy of issues. There's also the point that people don't want to reveal what they're really thinking, because there's a certain amount of distrust there. It could be all kinds of cultural issues. They are not all negative, but they are ones that we have to pay attention to.

So in terms of opening up, if you're trying to find a sales force and you've got all the sales potential, all the people involved in the [inaudible], you may find that it's not going as quickly or in the same kind of tempo or the same kind of dynamic as might take place in a company here in the United States. You've got to be paying attention to that.

The other thing that's very important is content. It's really the value in almost all international venues. We're very much product-oriented in the United States; in fact, in many other parts of the world it's content of a different nature. It's not so much entertainment, but there is scientific information that needs to be brought back and forth. There are real serious economic issues that people want to explore and figure out how to deal with, and there's a

seriousness about academic pursuits that is a little bit different and a little new to some business people.

Let me skip that. Let me give you a piece about indicators of quality on the Internet. This relates to a change from a print-based environment to an electronic- based environment, and it reinforces some of the things that I said before.

If you are publisher, if you are a writer, if you are a lecturer, one of the things that gives you some feedback and gives you some pride is recognition by one's peers — or recognition by a grateful audience or by a market that's going to pay for your book or your product. This we understand in a print environment. It's very important.

In a network environment these things become a little less important. Then you take a look at the next level. The next level of acceptability is to have an objective body — a professional, like a publisher — to accept your manuscript and impose their imprint on you. That gives you another level of pride and it's even more valuable than peer-to-peer because it is objective. It goes through some objective scrutiny and evaluation.

The seal of approval by your own society of peers is also important. If I'm an engineer, it's very important to have the approval of the IEEE on things that I do, or the American Chemical Association and so on. Most of that has to do with the evaluation process, which is this blind peer review process. All of that takes place in the print environment. We understand that very well.

In an electronic environment, what is happening is that the respected authority, the mentor, is becoming an important role model and a role catalyst in these things. Now, it's more important for me, for example, to find out what my colleague is reading and what lists she or he is listening to, and how they participate in things, because the mentoring is possible in a way that it isn't possible in print.

I can't always have mentors locally. I may have a mentor at Carnegie Mellon University; I may have one at Ford; I may have one at General Motors; I may have one at Manna. With a network environment I can now participate as a sort of a student to a mentor. Again, in an electronic environment, when you were talking about international work, this is a role that we play. Whether or not we're aware of it, it tells us how well we play that role. In fact, we're always going to play a mentoring role; we just want to be able to respect the power of having that role.

I told you about the International Organization for Information Specialists. It's mainly working in Central and Eastern Europe. Those of you who would like to do something good for Central and Eastern Europe ought to join that association. You won't get very much out of it in terms of "bennies," like local newsletters or meetings, but you will be doing something for people in the developing countries. It gives you an easy way of being able to find out what those differences are, what those people are like and what the cultural differences are.

Here's a thing that surprised us. When we started working — oh, this is now five years ago — in Central and Eastern Europe, we were the first to come in with Internet training, the first to bring in concepts of digital information and access to remote data resources. After three or four years — suddenly out of that mix of people who are working with us now collaboratively, not just as students — there came an awareness that there was a whole cadre of professionals. Now, I'm focusing on the library institutions because that's where I've been doing a lot of work, but it's also true in business.

There's a whole cadre of business people who need to be trained at the same time they are managing their business in an economically troubled, changing environment. The idea of an International Library School arose in touring Poland. This is where Nicholas Copernicus was born. It's nice there. What they are trying to do is establish a bunch of Post Graduate degrees where professional librarians who are actually working in the field can come in for one or two

or three weeks at separate times during the year for lectures that might be delivered by distance education. Some might be delivered by video conference, some might be delivered by exchange of faculty. Then they would go back and deliver their papers via the Internet to profs and people who would mediate those and then be able to do some kind of an internship where those librarians could go out and actually see what's going on at the [Bogulean] or the [Vivotech] National, or at the Library of Congress or anyplace else.

[Tape change]

Czeslaw Grycz: This helps develop a Post Graduate, on-the-job training facility so that these people can, at the same time as they are managing their own businesses, learn a little bit about the new ways in which business is changing because of digital information. It's a very interesting model, and I just wanted to let you know about that. It's a model that I think is going to succeed. We're in the middle of talking about that, and developing the proposals and so on.

All right. Let me come to some conclusions. Why you should be involved? I think there are several reasons. The ethical one is right up there. There's a certain responsibility that we have. I've forgotten where the quotation comes from, but it says "to whom much is given, much will be demanded."

I think that's really something that we have neglected in the Internet society. We've neglected it in the Internet on-line community; in fact, we have a great deal of richness in terms of the skill sets we have developed and the kinds of abilities that we have. We need to share those. There are some social reasons also, because I think that the Internetting experience and international Internetting experiences are the surest way to evolve the human presence on the earth.

That sounds sort of lofty, but in fact it's true. If we want to develop a peaceful world environment it's going to be based on open communications and open understanding of different cultural values and different interests.

From the cultural point of view, it's absolutely true that world populations are differently gifted. As a matter of fact, if we're going to advance at all we not only have to recognize and incorporate those gifts, but we have to be accepting of all of them. [We need to] see what new mix comes from that. That's something that, again —especially after the OJ trial, for example — I think we could do an awful lot of good for ourselves in understanding this component of the Internet, especially in America. Of course, economic business opportunities abound in both directions.

So my predictions: I think that by 2020 the Internet will be recognized as the most effective tool for decimating democratic free market philosophies. It's something that Congress, most of the higher education and most business people don't yet understand. This is probably our biggest and most effective outreach for democratic consensus building, decision-making and free-market economies.

It's an extremely powerful tool that we have, and it's a powerful tool because it doesn't have this backward look cast one to many — but many to many, and the mix that comes from that. It's a very exciting, challenging and enriching kind of process. I also believe that pure capitalism will not be allowed to dominate. There's an awful lot of concern these days about commercialization on the Net. You certainly get this question on the campus all the time: what's going to happen when MCI takes over? What's going to happen when AT&T gets in there? What's going to happen when Viacom puts in?

All of those influences will be there. But if we stress the community-building aspects, we'll also demand that those are preserved, because those are as valuable as any commercial economic gain. I also think that well before 2020 businesses will have integrated Internetting

into their operational system so it will become just a single piece of the work and the strategic plan.

So my recommendation is to focus on service. Think of service more than products, because that will get you a little bit further. Learn, seek out and value cultural difference — because that will enrich you personally and will make you better business people. I also suggest that you join IOIS if you want to support Central and Eastern Europe. I definitely think that you ought to involve yourselves in this International Library School. That's an awareness that all of us can benefit from.

One of the neat things is that the world is trying to deal with electronic information, pricing structures, access issues and so on. Having the school in which we're all involved, anyplace on the globe, will involve each of us in exactly the same kinds of issues.

It's a great area. I encourage you to be very aggressive about getting involved in international Internetting. For a couple of minutes, I'll answer any questions that you may have. Yes?

W: [inaudible]

Czeslaw Grycz: I will be happy to. Any other questions? Then I'll turn the floor over to Laura. She'll give you a less lofty perspective on doing business. I think that will balance pretty well with what I've presented.

INTERNATIONAL COMMERCE PUBLISHING AND DOING BUSINESS ON-LINE IN A MULTICULTURAL WORLD



SPEAKER

Laura Fillmore

President, Online Bookstore, Inc.

Laura Fillmore: I would like to introduce my colleague [Lydia Zalefski] here, and she is probably one of the first living examples we have of successfully doing business on the Internet.

Lydia came to us from Romania about a year ago. She heard about On-line Bookstore on the Internet and read a lot of the papers that I had delivered and said, "Well, I want to go work at OBS." So, that's Lydia Zalefski driving the machine here.

We had a very interesting question right before starting up. Someone came up and asked me whether this is going to be more about publishing or about doing business on the Internet internationally; and one of the things that has become clear to me is that virtually anybody who is doing business on-line is, in fact, publishing their business. I mean, it's a recorded environment on the Internet, and so if you're doing business you are, in fact, publishing. I think that a lot of the examples — we will be using three books as examples of doing business on-line — but I hope that some of those examples will be useful in terms of thinking about doing your business in the international environment.

So the presentation today will include nine maxims for doing business in the global environment. I can jump back a couple of years to one more anecdote about the first time that we really did an international publishing project. It was two years ago, when we got the rights for a Stephen King story to put up on the Internet. We did that in German and in English, and it really represented for the first time that a major author or major publishing company was doing business on the Internet.

It also illustrated some of what the most salient aspects of doing business on the Internet are. It's a distributed environment, and when we begin to work on the Internet we are creating something that has never existed before. When we proposed putting links into Stephen King's short story the editors and the publishers said, "No. You're not allowed to do that because what you're doing is going to change his story." In fact, yes, that's very true, and what we are doing in terms of publishing on-line is, in fact, different than any other kind of business model that publishing has had before; because if we look at the first maxim, we're looking basically at [the fact that] doing business on-line is a process as opposed to a product-oriented business.

So if we click on "I," you'll see that in the past publishing has meant creating a book, a physical product, and using the Internet as a distribution channel for that product. When we begin to do business on-line the ideas and information contained within that product are then released freely onto the Internet, and the challenge becomes how to make those ideas and that information fully available but not available for free. So what we've been doing is pioneering the business models which will enable people to access the ideas and information contained in a particular book.

One of the important things about beginning to work in the international environment is that there is no blueprint; there is no one right answer or one way to do things. What we've been doing in all the books we've been producing is basically trying a different approach with each project, because what we are attempting to do is discover the maximum number of users coming in and using or experiencing the information in a book as opposed to reading it sequentially from beginning to end.

A lot of the publishers — we've been working with publishers for three years while publishing on the Internet — and they'll come and say, "Well, Laura, are we selling more hard copies of our books yet? Are we making money yet?" And I think the key, the key question, is really instead of "Are we able to retrofit our product-based business onto the Internet," the more important question is "What are we actually selling?" Is it the right question to say, "Are we selling more hard copies of books by virtue of the fact that they exist on the Internet?" Might it not be more interesting and more productive and commercially viable to ask, "What, in fact, are we selling on the Internet? How do we sell ideas and information when a book begins to breathe and it enables itself to be accessed by its users? How do we charge for that? What's for sale?"

When beginning to work on the Internet, I'd like to encourage everybody to basically leave your brochures and your billboards by the side of the road, because retrofitting old models of doing business in a product-based world onto the Internet doesn't necessarily work. The real challenge is how to make your company available to the new global audience, not necessarily putting up a big sign and saying, "Here we are. Where is everybody? Come and buy things from us."

Okay. We talked about freeing the ideas, and [how] information doesn't necessarily mean giving them away for free. One of the basic challenges of working and doing business on the Net is that it's an adaptive machine; you can have an idea today and try it, but you have to be alive to how that experiment is succeeding. You have to adapt your business model so that it's not a concrete thing that you just pursue. It's an interactive process between you, the business person, and the user who is accessing your company.

So we'll go onto the second point of doing business on the Internet, which is "activity mirrors architecture." One of the salient aspects of the Internet is that it's a distributed system, it's not a centralized system; so that because of the fact that it's not owned by anybody we have to change our model of doing business. We're changing essentially from the product-based to the process-based business, and we're changing from terrestrial to cyber models. This calls for a fundamental change in the economics of doing business, which means cooperating as opposed to simply selling preconceived products to the world market.

Do you want to click on that, Lydia? One of the examples I'd like to point to is Nelson Mandela's book *A Long Walk to Freedom*, which we put up on the Net for Time Warner about a year ago. We did that in English, and that was using what we call the "sponsorship" model, meaning that our client paid us to put the book up, and the idea was that we'd get many, many hits on this English language version of the book. The result is that people who wouldn't ordinarily see the book would then go into bookstores and buy it, or would buy it through the On-line Bookstore. The hits on the book — the number of people accessing those files — have been rising over the last year, and I would like to attribute that to the fact that it has basically been an "internationalization" of that book that's been going on.

In April we got their rights from the German publisher to put up a German section of Nelson Mandela's book *A Long Walk to Freedom*, and the hits continued to rise after doing that. When we put up the German version of the book we also made an arrangement with bookstores in Germany and in the United States to be able to fill the orders for the German version of the book; and as the hits increase on this site they're increasing internationally as well as nationally.

Then we started to notice that there were a lot of people from Brazil coming into the server, so we thought "Let's respond to this marketing information and get the Portuguese rights to Nelson Mandela's book, to respond to the users who are coming in to look at Mandela's work." So we went to the Portuguese publisher and got the Portuguese rights to the book, and we put that up for the Frankfurt Book Fair, and the hits on the Mandela files tripled.

So what that means is that we're expanding the market for — you know, in the past, in the product-based model, Time Warner would publish the English-based book but it would be distributed in United States of America, North America, the Philippines, wherever the rights for that distribution are; but as soon as we begin to put up other languages the use of that book really changes, and the market changes. Instead of just being of interest to the trade book audience or the general book audience of people who are reading biographies, it becomes of interest to foreign language classes, it becomes of interest to more people overseas who can access multiple languages and toggle between languages, and it does increase the print sales of the book.

So the "hybrid" model exists; what we're giving away for free on-line increases the sales of the book, the product that they're effectively selling.

So the activity there then does mirror the architecture of the Internet, which is distributed. We're cooperating with the German publisher, the Portuguese publisher and the American publisher. We're not creating a product in one place and distributing it to the world, but rather we're using the distributed model of doing business to increase business for all three publishers in all three countries.

Using this same model in terms of doing business reflecting the architecture of the Internet, there's a fairly radical statement that Steve Wolfe of NSF, the National Science Foundation, said. He said, "Every client [is] a server," which means that everybody who has a machine, everybody who is connected to the Internet can, in fact, begin to do business and can, in fact, begin to be a publisher. What the architecture of the Internet [does is] basically take out the middleman so that the author can become his own kind of publisher; and in successfully doing business on the Net one avails himself of that opportunity by incorporating people and companies with their independent servers as constituent parts of a global business. A lot of doing business internationally does involve creating business partnerships with servers sited in other countries.

[I'd like to discuss] how we've addressed the legal issues of doing this, in terms of bookselling. How do we go about actually selling the books, which fuels the marketing money, which enables us to put the books up on-line?

That's basically through that distributed model, by cooperating with bookstores around the world; so if we get an order for the Portuguese version of Mandela, instead of our company buying Portuguese language books from Portugal and re-selling them — I mean, that's not my business. Our business is doing the on-line version of the book. We cooperate with the bookstore who is already set up to sell Portuguese books; and when we get an order for the German book, we've gone to Germany and created a partnership with a bookstore there who will fulfill the German copies of the books, because — as you might imagine — the whole international arena is fraught with existing laws about pricing of books and distribution of books and taxes on books. So how we basically address that issue in order to do the international business is by cooperating with terrestrial-based businesses who are already doing this. So that's basically the local-use maxim that we see there.

One of the last issues is a world that we've kind of invented for addressing the issue of publishing, [and that is] "cogniright," the right to think freely on-line. We're in the publishing business, so we're keenly concerned with the whole issue of copyright; and, in fact, we do have a copyright notice on the bottom of all of the pages which we publish. But I'd like to introduce the idea to you, and perhaps we can re-visit it in the question and answer session at the end.

[This idea is] the new notion of cogniright, our right to think freely on-line. To whom do our on-line recorded thoughts belong? I assume that most of you are familiar with the WorldWide Web for doing business, and living on the Internet. If you look and see your

session paths at various servers, to whom do they belong? And what kind of right of privacy do we have to the way that we interact with other people's servers?

I think this cogniright issue is an important one that we think about quite a bit in terms of doing business internationally, because a lot of the business that we do is based upon the business decisions that we make, and is based upon people's thought paths, people's paths coming through our server. So the question of cogniright, I think, becomes more important the more business we do.

Let's go back to point number three. Finding your customer means enabling your customer to find you, "customer" being anybody who's out there on the Internet. And again, this goes back to that first maxim about how doing business or publishing on-line is a process as opposed to a product-based business. You can't just take your brochure and put it up there and say, "Well, I'm selling watches, and so here is everything you need to know about my watch," and wait for everybody to come in. You have to give as well as get information on the Internet.

In thinking in a new way you're going to want to figure out what you can give away for free in order to get the traffic into your site and be able to sell whatever it is you're selling. And again, to go back to the question, "What is it that's for sale?" I believe that once you start to do business on the Internet you'll find that some of the preconceived notions about what is for sale might become very different indeed. In fact, what you used to charge money for or what you are today charging money for in a terrestrial-based business might, in fact, be free, and what you haven't been charging money for might be charged for.

Let me give you an example. This is, again, a book publishing example. Right now if you go into a bookstore and you say, "Well, I'm a beginner astronomer and I want to find a beginning book about stars, and I want to spend \$20.00, and I need it by Friday," you would ask the clerk [those questions], and if the book clerk is an intelligent book clerk familiar with the business they would tell you what book that you want to buy. There's no charge for that information, and the bookstore makes its money by selling the hard copy of the book.

I think that as we do — and what we're finding is that we do more business on-line — that perhaps that book will not be free but that information, that intelligence from the book clerk, may very well be what's for sale. Okay? It's an idea. It's an intangible, and the challenge before us is to figure out the weighted value of that information.

Same thing with a hardware store. You go into a hardware store and, you know, your toilet is broken and you need some kind of joint to put on it. You don't want to go to — you don't necessarily need a product catalog in order to shop from; you need the intelligence of the person to say, "Oh, you've got this kind of joint, this kind of pipe. This is what you need." That intelligence may very well be what's for sale on the Internet.

And a third example from what we've been talking [about] is with advertising marketing firms. My company had a link that I started twelve, thirteen years ago. It used to be a product-based business where we would go and sell the capability to create brochures and books to publishers; we went into the advertising company, and what they wanted to buy from us were the ideas about how to advertise and market on the Internet. What we used to charge for — the whole production process of creating a booklet — we're doing that for free. What they're paying for is the idea, is the intangible. And I think that's a model for doing business on the Internet.

I mentioned the Mandela book having its market changed by doing business on the Net, and increased, in fact, by virtue of the fact that it is an international publication. If we consider that doing business and publishing on the Net is "contextualizing," as opposed to just putting content up there, it's the context that really matters; it's the capability to interweave what your product is or what your book is with the other available resources that are out there on the Internet.

As a business person or as a publisher, one seeks not to necessarily push or promote a particular product or book but rather to create an interest area, a generic interest area which many people will visit because you're giving away information. So if your business is, for example, a shoe store, instead of just putting up a product list of all the shoes that you offer you would really want to be seen as "shoes.com," so that people would come to you to learn all about walking and all about shoes. That's what's going to bring the traffic to your site, and traffic is the desideratum of doing business on the Net, because you're not going to be able to make money and determine what your business is unless you get that flow of tens, hundreds, hundreds of thousands of people coming into the server.

We'd like to go on to Item number four, [which is] "customized access is better." Access is all; customized access is better. When doing business on the Internet it's important to realize that everybody out there it is not only an English language-speaking audience. We've been lucky to be working with a best-selling author, [Bernice Chessler], author of *Bed and Breakfast in New England*. We've been her agent for many years, and we've been publishing her book on-line. She started out publishing "zoom" books for WGBH TV as an author, and she's published many books since then and has been working — [she's] actually the first author to put her book up on the Internet in distributed version with On-line Bookstore. And now this is the second edition of *Bed and Breakfast in New England*.

Where this is different is that it caters to the international market. Increasingly, a lot of bed-and-breakfasts in the United States are receiving traffic from overseas; so Bernice thought that in order to pioneer a new model of publishing on the Net she should cater to not only the on-line audience, but to the international on-line audience. In so doing she has created a distributed project which involves linking to many of the aspects out on the Internet.

So instead of having a linear book, where one begins on page one and proceeds through the end, one can access the book according to the custom uses that each reader has in mind. So, for example, if we think, "Well, we want to travel to Cape Cod this weekend, it looks like it will be a beautiful weekend," we're accessing the book not only through the table of contents and through the index but through the graphics in the book.

Another interesting and key point about this is that Bernice's book doesn't exist yet; Chronicle Books will be publishing this in January or February. So what this is doing is, in fact, increasing the market for the book before the book exists, so we're using the Net as an advertising vehicle. If one is a German citizen and wants to travel to United States, they're going to seek out the custom access to the book and seek out a German language [facility]; they want a host at a B&B who speaks German.

So what we can do on-line far exceeds what we can do in paper in terms of enabling the customization of the book, of the product. The book exists in English; we translate it into German to make it accessible to that audience. The book is one-color type throughout; we can include four-color pictures at much, much less cost than it would cost to have four-color pictures in the book. The book has those general maps or maps that look kind of like what you just saw on the screen; here we can offer customized access that will take you to the dirt road right in front of the house by linking into [Delorme Mapping Service]. And that illustrates another business model for doing business on the Net, where this book is now freely accessible to anybody who's on the Internet.

Where the opportunity for making more income for the author and for the publisher comes in is in the aspect of microbilling, in charging for those very customized accesses to the book. So if I want to find out, you know, exactly what the dirt road level is to the B&B I want to travel to this weekend, that could cost 25 cents or 50 cents; it's a microbilling model in addition to the freely available text up on the Net.

So let's say your German citizen — well, this guy wants \$119 to come to my B&B this weekend. How much is that in Deutsche marks? So by virtue of linking, linking with the book, you can go to Travel Links — at the bottom, Lydia — and then we can look at the currency converter. You can change the dollars into Deutsche marks, so that as well as customizing the maps you can also customize the currency converter. We can take a look at the Dbase chart, right? So you could customize access to the book.

We can move on to number five. Is it still live? Okay. "Link-think in multilingual mode." We are what we are by relation. Basically, the kind of work that we've been doing is what's called "distributed publishing," and what we do is enhance or expand the content of a particular publication by contextualizing it through linking. Another book that we've been working on is one for Random House, *The Practical Guide to Practically Everything*, and there we've been licensing links so that instead of actually buying information to link to this particular book we've been licensing information — which, again, enables the reader or user to customize the book to his or her own needs.

So if we take a look at the "Health" section of *The Practical Guide to Practically Everything*, you'll see the red triangles indicate chapters of the book, which are basically exactly as they exist in the publication. And, again, this one was done prior to publication, so it serves as a marketing as well as on-line publishing; it serves as marketing for the hard copy of the book. If we look at the Health section, you'll see the bottom line there without the triangle next to it is new contextualizing information that we, in fact, license from the people we're linking to.

So, for example, if you're reading about cholesterol in the Health section, this will take you to a specific page whose content we have licensed from Harvard Medical School. So we're not just illustrating what's in the book by virtue of linking to external sources, we're in fact licensing from the people at these organizations so that we're getting specific content linked directly to what the book is all about.

What this is really called — we're calling it a "living, breathing footnote." In a paper book, if you have a footnote that's at the bottom of a page, that's going to point you to another source somewhere on the Internet; whereas when you're publishing on-line you not only point to another source but you also include it — you actually include it with the publication so the reader then determines how far he goes into a specific content area.

Another example of internationalization in this regard — Lydia, if we go back to the "What's New In Health?" — is *Der Spiegel*, because they too have agreed to be linked to this particular book. So if you're a German reader, and you're interested in what the archives of *Der Spiegel* magazine, the German news magazine, have to do with current health issues and specifically cholesterol, this link into the German server will enable you to do that. So what we're doing is essentially, again, building contextual fields around particular content areas, which serve on the one hand to spur the print sales of the book by virtue of the many, many hits on the particular book, and then secondly serve to pioneer a new business model which we're calling microbilling. As the information gets more customized to each reader or user, then it becomes clear that the reader or user will be willing to pay small, incremental models, incremental amounts of money, for that information.

A third type of link that we've put in is the link of the human being. *The Practical Guide to Practically Everything* has many experts behind it who have contributed to the various aspects of the book, and so we created a forum; in fact, again, this is a licensing arrangement with books.com where we have our book situated in their Forum section so that the people behind the book are able to talk to the people in front of the book. So the experts who inform the ideas and information the authors write about can talk directly to the reader, so we have a kinetic on-going aspect to the site.

That same sort of interaction is possible in [Bernice Chessler's] *Bed and Breakfast in New England* where we have the postcards to the author, where the readers are able to write to the author of the book and, in fact, write to the individual B&Bs, so that the book becomes a process and it becomes alive in a way that a static, paper book finds impossible for that to happen.

Let's go on to number six, Lydia, to "Adaptive Machinery Speaks Many Languages." We're taking a look at number six in developing relationships and linking relationships with other businesses who are involved in the projects that we're doing. What we're sharing is the income model and the billing model; but we're also, importantly, sharing the information, because what people are most interested in at this point, again, is the attention and the use that people make of the particular server.

So with the Harvard Medical School or with *Der Spiegel* and with books.com, what everybody is interested in is how people are accessing the various servers, what the path is and what the session path is through the various sites. And we're paying attention to those statistics because that's indicating to us what is succeeding commercially and what is not succeeding commercially, so that we can adapt our structure and adapt our approach accordingly.

If we take a look at the "Global Book," this is an example of what we've pointed to thus far. *The Practical Guide to Practically Everything* and [Bernice Chessler's] *Bed and Breakfast in New England* are both real projects; these are real books that either exist or will exist soon. In order to develop good relationships with publishers and other companies overseas, we're pioneering books that don't exist yet.

In fact, I'd like to talk for a minute about EInet, which is an Internet service provider in Germany. Together with them and the Frankfurt Book Fair we've launched a new project called "The Global Book," which is a book that was started at Frankfurt Book Fair about three weeks ago and was initiated by the Frankfurt Book Fair and CDC, which is the advertising company behind the Frankfurt Book Fair. They've asked us to put together an organizer project over the next year, in multiple languages, which will end up being a book published by a publisher in this country and overseas. That type of cooperation takes us further than just marketing books — which already exist — into creating books and creating business models which can be adapted for other uses.

Where are you going, Lydia? Yeah. If we look at Deutsche we can see that. So this will show you the constituent parts of the collaborators in The Global Book project, which is basically, as I said, an advertising agency, an on-line service company in Germany. It's the Frankfurt Book Fair itself, it's the AAP, the American Association of Publishers, and it's a lot of different complimentary organizations which together are going to create a publication of a kind that hasn't been seen yet, because it is an on-line publication which will become a product-based publication.

Where it's initiated is on-line. We invited people to begin to contribute to the book and publishers are, in fact, supporting it in terms of contributing editorial skills.

Here we're back at books.com, and we see the beginnings of what will become The Global Book published at Frankfurt Book Fair in 1996. And it presents a lot of the issues about on-line publishing.

It starts as an English language book, and the contributions are coming in many, many different languages. The first one, obviously, is the German one because that came from the Frankfurt Book Fair. What we're looking at is the initial announcement from the Frankfurt Book Fair about The Global Book project. If we look at [Fredrika's] contribution we'll see a German language contribution to the book.

One of the challenges and one of the participants in The Global Book will be the Internet itself. Some of the tools and capabilities of the Net will be natural language translation

capabilities, so that we will be putting this German text through a natural language translator to create an English language text, and in so doing will define for the participating publishers and organizations what type of publishing business succeeds where the commercial models lie on the Net.

We should take a look back at the Mandela, Lydia, because that — I'd mentioned earlier we began that project with Time Warner — that illustrates the collaboration not only of book publishers here and in the United States, but it also illustrates the collaboration of multiple types of companies on one particular project.

Again, where this is helping the publishers, helping the companies we're working with in terms of books — just recently we've added a site at Miramax Films, and we're going to be working with them to do *Cry The Beloved Country*. *Cry The Beloved Country* has to do with [Alan Patton's] book and South Africa, and the link from Miramax into Nelson Mandela is going to increase, again, the number of people who are coming to the site to experience not only the book but also the film. So we can take a look at the Miramax site which will lead us into Nelson Mandela. We could just start up at the top, at miramax.com.

So the important thing is that multiple companies are here benefiting from on-line distributed publishing. This is a site — and I'm giving you kind of a preview — this just opened about an hour ago, and it wasn't up here yesterday. And so the "Miramax Cafe" is where we'll travel.

Miramax is, again, doing the film that has not yet been released, *Cry The Beloved Country*. Last week, at the premiere in New York, Nelson Mandela spoke. It's a book that was written back in the '40s. If we click on the "Concession," what you're seeing, again, is the licensing, is the interlinking of multiple sites.

If we take a look down at "Books," here's a book that's published by Simon & Shuster that's going to be — that is, in fact — included into the contextual web of books about South Africa. This is leading into the Internet version of Nelson Mandela's book, so that Miramax Films is able to capitalize on the tens of thousands of people who are coming into the site to experience Nelson Mandela's book; and, on the other hand, the Nelson Mandela publishers are able to capitalize on the many people who are coming into experience *Cry The Beloved Country*.

So what we're doing is what I mentioned a little bit earlier, the whole idea of creating a contextual site, a general type site, that is not just one book being marketed. It's not the graphic image file of one book and a sample chapter which is selling one copy of one book, but rather it's the evolution of the context of ideas in a particular subject area. So we can, in fact, sell you the book from the server, and that capability has become a lot more sophisticated recently. We can, through a secure Netscape server, take your credit card and sell you a copy of the book, which is what the publishers have been interested in all along in terms of doing their product-based business.

What's illustrated here is kind of what we're trying to do, and that's make a seamless jump, a seamless leap for the user so the user doesn't necessarily know what server he's on. We're linking together servers all across North America and Europe in order to do this; but right now this is a basic "buy" form. If you want to go in and buy a copy of *Cry The Beloved Country* or any of the Miramax-related items, here we are within the store. You can click on "Books," and so this kind of addresses the publisher's basic interest in selling physical copies of a book, and we're selling to the global audience.

You know, it's not just people who can walk in the physical front door of a bookstore, but anybody in the world who's coming to buy this book. And again, the fulfillment is not us buying from the Miramax stuff — which is coming from twenty, twenty-five different sources, and we're distributing that fulfillment out to people who are inter-networked with us. We're not necessarily buying and selling the physical things ourselves, but I think this capability of doing

business and taking money over the Net is an important component that people have been looking for for some time.

In the meantime, what we're finding is the important business for the film company and for the book company is the marketing and promotion which comes from the distributed version of the book. If we can go back to the distributed version of *Cry The Beloved Country*... We're in the store right now. We leave the store, and we can go to the Internet version of *Cry The Beloved Country*, which is in the middle, and that itself is an interweaving of the movie — it's *Cry The Beloved Country* the book, it's Nelson Mandela's book, it's an inter-linked project which is going to change on a daily basis just as a movie changes on a daily basis. At any time you the reader can go back and buy a copy of the book, and the more people we have accessing this site the more people are going to buy Simon & Shuster's book. They're going to buy Time Warner's book and they're going to go see the movie *Cry The Beloved Country*.

And another interest — there's the link, Lydia's pointing to *The Long Walk To Freedom*, and we click on that and that will take us back to the Mandela project. So it's up to the reader; it's a reader-driven medium, and the reader can determine what book he wants to go into more detail about.

Do you want to go back to the talking points? I think we should, because we're going to have to come to a close fairly soon. So this project, I think, illustrates quite nicely the whole idea of "contextualizing" not only many different businesses but also many different international businesses. Our job with the Mandela book is to basically interweave companies doing business in multiple languages and to sell products in Europe and Africa and around the world. I think that has effectively shown that.

Let's jump to number nine, Lydia, and then I think I'd like to open up for questions. The files for this presentation are available to anybody who wants to access them up on the Internet, and also through meckler.com. But I think that one of the most interesting things about what we're doing this morning is the fact that Chet [Grycz of the Wladyslaw Poniecki Foundation], who preceded me in giving his presentation, and I haven't really talked for six to eight months, and a lot of what I'm saying about the importance of the evolution of an economic model to enable people to do business on the distributed Internet fits really well on what he's talking about conceptually from an educational point of view.

We are, in fact, implementing this with companies around the world in multiple languages; and just looking out at the room I would assume that the people in this room have a collective connectivity capacity that far exceeds a lot of the countries and continents that we've been traveling on. And I think that therein there's a great responsibility for all of us to do good and important work in terms of developing the on-line thought machine, which will become the business model of the future in terms of our information-based society.

I would like to open things up for questions if anybody has any questions about publishing on-line or about doing business in an international environment. We've got fifteen minutes, and we've been doing this for a good number of years, and I hope that we'll be able to answer questions — either I or Chet, who's in the back there, or Lydia. Yes?

M: Could you talk about what your user interface is going to look like? Can you talk about your model of [inaudible] media transactions or whatever?

Laura Fillmore: Microbilling?

M: Yeah.

Laura Fillmore: Well, the store is probably the beginning step of that. We have been negotiating with a credit card clearing company which will enable us to do microbilling down to pennies, because I really think that that's important, the "penny for your thoughts" approach to things; so that people would come into the store, and if you click on, say, [Bernice Chessler's] book, *Bed And Breakfast In New England*, and you say, "I want this map, and I want it by tonight," you have specific information that this would cost 10 cents or 20 cents or whatever the micro amount would be. That would accrue until a plateau is reached of five dollars, and then the five dollars is charged to your credit card.

If you look at the store in the sign-in procedure, you are supplying your credit information and becoming a member so that when the microbilling model is implemented, then it's through that kind of vehicle. But it's also — to go back to the store — it's also something that the user would be very aware of, so that you're not going to be charged without knowing it and get credit card bills without having approved them in advance. You have to take your aggregated ideas and contents to the cash register before you can leave. Yes? In the back?

[Tape Change]

M: [inaudible]

Laura Fillmore: We've done both. We do sections of books. In *Bed And Breakfast in New England* the whole book is going to go on-line.

One of the most successful hybrid models is one we did with McGraw Hill, *The Paperless Publishing Book*, where we have the whole book there on-line. A lot of people say, "Well, how can you do that, because if you have the whole book on-line then who's going to buy a paper copy of the book?"

I would argue strongly against that because, as you've seen from some of the books that we've shown here, these are really chunked up so that if you went into *The Practical Guide to Practically Everything* and stripped out all the codes and printed out the whole thing, it's going to take you hours and cost you much more than buying a copy of the book. So that the argument with publishers is that putting the whole book up is a very positive thing. So, yeah, we do put whole books up. Yes?

M: I'm very curious about the state of development of machine translations. How far have we come? You know, what's the viability of that in a book fair?

Laura Fillmore: Hmm?

M: Or a project in terms of getting the liable translations [inaudible]?

Laura Fillmore: Well, we want to use the best that's available, and we're not going to be able to translate Dante from Italian into English, but the idea is that it's going to involve the readers and the editors more. We're going to be using the natural language translators that exist now, and based on what they've produced that's going to create fodder for the translators that are going to be involved with the book.

And that's where the publishers come in, too. We're really interested in working with their translators and with their editorial departments. And then what do you do once that translation has happened? I mean, the idea is not that we've got something fully behind a curtain

or something that's going to come out and work fabulously; but what does work and how can we use it to further the work here?

M: In doing business internationally, the implications for that, are you sort of reacting [inaudible] to get things out of there?

M: And get them in German, French, and Spanish and whatever?

Laura Fillmore: Yeah?

M: Typically, in a North American environment you're looking at a very myopic group of people. English is the language of business. But in terms of really opening doors...

Laura Fillmore: They don't think that in Quebec.

M: It's just the interpreter; you know, the practical approach to it.

Laura Fillmore: Yeah, and I think that's why publishers and businesses are so interested in The Global Book, because for one company to do this, to spend the requisite funds to do natural language translation and to research and develop what is the best program and how much human work is required to make it work, if there are multiple funding sources for the project then that information is all shared among the participants so that it becomes a more valuable — becomes one of the values of participating. But the answer doesn't exist today. Keep your eye peeled on October, 1996. Yes?

M: How do you expect people to find information? Say I'm just interested in Nelson Mandela and wanting to find reading and whatnot. I mean, how do you expect people to find your interactive books?

Laura Fillmore: One thing that's been really successful... I kind of see each project as putting down roots. One of the jobs of a link editor, like what Lydia does, is not just to point to places but to initiate correspondence with people that we're linking to. So in Mandela's example we'd write to University of Pennsylvania and say, "You've got a really great site here on Africa, and we're going to link to you," and then they, in turn, link back to us.

With the Mandela project I've found more links to us out on the Net, and these aren't links that we've necessarily solicited, but people are finding us by virtue of the content area; and so I think that accounts for part of it. Also, we'll announce when something's going up.

We try to synergize, and, again, this is the hybrid model where hits on Mandela book result in sales of Mandela book, and hits on the [Chessler] book result on sales of [Chessler]. Bernice is on the best seller list in the *Boston Globe*.

You know, after we put the demo up, there's a synergy between what's available on-line and what's available in print and hard copy. So we try to synergize between what the company is doing in its traditional marketing efforts and what we're doing.

So Random House, for example, is putting out a print ad campaign for *The Practical Guide to Practically Everything* that'll have the URL on it. Time Warner put out a print ad for some of the projects that we're doing that has our URL on it, and their print ad is going to bring customers here to look at the Mandela book. Again, that argues strongly for the collaboration effect, because Miramax Films is going to benefit from Time Warner putting their URL up there. So that's where having a site where a lot of people are coming is a definite value.

If somebody opens up a server tomorrow with the greatest project on earth, if nobody knows he's there that becomes a real challenge; and I think that that's one of the benefits of licensing and collaborating with sites that exist there. And that's a point that I also would like to make in terms of this bipolar linking, this reciprocal linking. Most effective examples of that have come from personal interaction between servers, between people running the servers. "Hey, what you're doing looks really interesting. Let's see if we can link to your map site or link to your conference site." It's not PR and marketing; I don't think PR and marketing work the same way on-line that they do on The Globe. It's a much more personal interaction between people, and that's been pretty effective for us. Sir, over there?

M: How do the ergonomics work on the licensing for *The Practical Guide to Practically Everything*? That was [inaudible] for the right to link to these publications, or I don't understand what happened there.

Laura Fillmore: What happens there is basically defining who's doing what and watching the traffic. We're exchanging information at this point with an eye towards developing subscription and microbilling models. It's nascent licensing models until you're going to keep this up and keep this content up for X amount of time, and that's where it is at this point. We're collaborating with them to watch the statistics, to watch the traffic so that we can then refine the commercial model because everybody understands, again, that it's information that's freely available but not information that's free. Yes?

M: Are you aware of any microbilling models that actually work? I mean, are you doing that right now? It seems to me that the cost of this, implementing a microbilling model would [inaudible] away, especially internationally.

Laura Fillmore: Well, right at the moment, no. I mean, we're not doing it right at the moment. But First Virtual has a microbilling model where they're selling pieces of information. I don't know if Jane Levin is here. She's had information up there.

Any other questions? Yes?

M: What about the futures for things like [inaudible]?

Laura Fillmore: I'm sorry, I can't hear you.

M: The futures? Like, I can see the [inaudible] where you give away the paper book and microbill access for the on-line book.

Laura Fillmore: Yes?

M: That means that you'd have a piece of a laptop that had wireless connection, and if I was to get an international guide for bed & breakfasts there's no way I might have a whole book. It would be the size of a telephone book.

Laura Fillmore: Yes.

M: If you just want to print out just Boston...

Laura Fillmore: Yes...

M: Or just access it in the car, and I just get the information I needed rather than having to page through all of it, then that service [inaudible].

Laura Fillmore: When will it come? In '96, that's what I would predict. I mean, it's virtually there, but I think that it's coming a lot quicker than people generally say it is. I think it will be there in '96. Yes?

M: What kind of strategies are other publishers using? I believe the Electra Press has a book on that called *City of Bricks*.

Laura Fillmore: Yes.

M: [Inaudible] do something similar to that?

Laura Fillmore: Yes, they are. It is a distributed publication with a lot of external links to it, so that would fall into the category of distributed publishing. It is, basically, the same kind of marketing model that they're putting on-line with the expectation that they're going to be selling increased numbers of print books. So that is another example of distributed publishing.

A lot of publishers are using the Net as a marketing vehicle in terms of putting up flap copy and chapters of books and pieces of books so people can see what they're about and can download those.

The distributed model — I know MIT is active in it. Macmillan is doing some of it, and O'Reilly is certainly doing distributed publishing; but what we're doing is working with multiple publishers and companies in terms of exploring the ways that not just one publisher but many publishers can integrate and develop and use the business models for publishing the text itself. Are there any other questions?

I'd like to thank you all for coming, and we'll see you on the Net.

COMMERCE OPENING UP EUROPE! HOW TO GET INVOLVED



MODERATOR
Ivan Pope
Webmedia

SPEAKERS
Stuart Anderton
Future Publishing
Jo Mosaku
Consultant, Future Business Technology Consultancy
Roger Green
Publisher, *Internet Magazine*
Steve Bowbrick
Director, Webmedia

Ivan Pope: [I'd like to start] by basically welcoming you all here and just briefly introducing the speakers. We're going to each talk, and then we're going to invite questions from the floor and try and answer any questions you might have, and discuss what's happening in Europe to some extent.

We've got a rather unrepresentative of Europe bunch of speakers, as we all are based in the U.K., unfortunately. But that's one of the things that happens, logistically. So I'd just like to introduce the people who are going to be speaking, and they are, first, Stuart Anderton.

Stuart Anderton is a publisher of a magazine called *NET* in the U.K., and also an on-line publication called *Future Net*, both Internet publications.

Joe Mosaku, second from the end, is an independent technical consultant based in London, but has a lot of connections in the States.

Roger Green, just arriving here, is also a publisher of a magazine called *Internet* in the U.K., and that's from a publisher called E-Map.

And our main speaker, Steve Bowbrick, is now second from this end. He's the Managing Director of Webmedia in the U.K. It's a Web designing, Web site designing and building company. It's a market leader in the U.K.

And I'm Ivan Pope. I work with Steve, and I'm also Managing Director of a company called WebContent, which is a content developer for the U.K. in the European market.

So I'd just like to introduce Steve Bowbrick, who will take us through the current situation in the European market. Thank you.

Steve Bowbrick: We've just lost the video, it seems.

M: Press I, Steve.

Steve Bowbrick: I'm going to press I. I think it just died, because it fell off the [inaudible]. In the meantime I'll just get started.

My name is Steve Bowbrick. I'm managing director of Webmedia, as Ivan said. Webmedia is a U.K. market-leading Web production house and creative house. And the recent diversification that we've gone through takes Ivan out on to the wing of it, and now Ivan is the Founder/Partner of Webmedia, and he's running a business called WebContent, which is an independent content developer for this weird new medium.

Okay. So there I am, there are my contact details in case you need them. So, I've got a pretty broad topic here, Europe, really. It's an enormous place. I figured, well, what I could do is I could take an approach where I start with just sort of the fall of the Roman Empire, and then work up to the present day. But I think that I'll just cut to the present day.

Now, it's a big place, and I don't know if it's commonly known that there are more people living in Europe than live in the United States of America. There are 300 million people living in the continent of Europe. And I think this number is accurate. The European Union essentially has a population in the area of 300 million people, and it's growing very, very fast. In the most there's 15 countries. There were 12 until quite recently. It's, as you know, not the most coherent place in the world. And I think if you've been watching the events in Yugoslavia over the last year, apart from obviously the human tragedy of it it's had something of a bracing impact on Europeans, because it's been a fairly profound indication for us that even an ancient and relatively stable continent is liable to that kind of disruption.

So I think that there are presently — this is my guess — I'm guessing that there are 30 distinct, viable languages in Europe. I think if there are any linguists in the audience I'd welcome your challenge on that. Now, some of these languages, again, it has to be remembered, don't even use the Latin character set. So, it's a pretty diverse area.

I'm stating the obvious when I say that this market has distinct national identities. And of course, I've just touched on one of the negative impacts of that. But there is — and I don't think I'd be distorting it if I said this — there is an increasing coherence in Europe, and the European Union is the instrument of that. And I come from a country on the northern fringes of Europe where the current government is actually, broadly speaking, anti-European Union and seems to be drifting towards — even as we speak — leaving the European Union, if we listen to the more extreme elements of that government.

I think that I have to emphasize that the business people in Europe believe in the European Union, and believe that it's vital, that it is absolutely vital in our future as businesses and as a community.

The "ancient culture" bit, I suppose that's also kind of obvious, isn't it, if you think about it. But I did feel the need to state that, even if only to contrast it with the culture we're in now, which is where buildings have plaques on them that say "Built in 1948," or something. This is something that's kind of interesting to us. So I want to emphasize that. The ancient cultures have the other "C" word, content, and it wasn't invented until about three years ago, I think it's something like that. But ancient cultures do, broadly speaking, create rich content.

So here's one of the problems that we're up against in Europe. We've got what I've just called here, flippantly, sort of "technology gradient." And broadly speaking, it's north to south in Europe. Much of the wealth gradient is, broadly speaking, north to south in Europe. One of the EU's key functions is to try to even out that gradient to some extent, and there's an interesting conflict going on between the sort of supply-side modernizers in Europe, to the extent that there are very many of them, and the more sort of — what would Americans call it? — a big government approach, which is in, which is how Brussels is typically characterized, especially in Britain by the Major government.

So that work goes on, though, and there is a considerable distributive element to what the European Union does. It's sort of spreading wealth and resources across the continent. And again, that's vital when you're talking about infrastructure issues, which is what we are talking about here, essentially. If we don't have the infrastructure then we don't have a viable medium. And I think that if part of the continent does have a viable infrastructure, as increasingly the north does, then the whole of the continent is impoverished if the rest isn't involved in some way.

Now, the, to say that we have different regulations or requirements in these various nations is a bit of an understatement. We go from the highly liberalized Northern European examples, the U.K. being the leader, I suppose, to countries which I don't think it would be a distortion to say are still operating — although somebody's going, somebody's probably going to throw something at me for saying this — still operating essentially 19th Century models of government and administration in other parts of Europe. And I'm not naming any names here.

So that's an interesting, and it's another element of the gradient that we're dealing with here. And I think that as we try to spread this, this information culture out into the fringes of Europe, this is a significant element that we have to deal with. The uneven national wealth, well, I can roll those last two points into one, I think, in that Europe is a place where per capita income is, I think on average, lower than here in the U.S. This is especially the case of the U.K. now, where we seem to be operating something which I read described as "Hong Kong-ization" the other day, where there's a sense that there's an Asian model of business and government being pursued.

This means that there's less disposable income, especially in those North European countries where the cost of living is also very high. And disposable income is obviously a vital component of everything we're doing. Because that where we're speaking to consumers, I think a lot of people here in this room and a lot of people on the platform are focused on speaking to consumers. When you're speaking to a consumer, naturally disposable income is a vital element, and the assumptions you make about the disposable income of your market here in the U.S. may not carry to the European markets, and certainly won't carry to large parts of Europe.

So let's have a look and try and expand a bit on this regulatory thing. The problem here is that I can't just can't describe one regulatory regime. We're not talking about steel or agriculture here. We're talking about a medium, and we're talking about a medium that operates at very low logical level, the Internet, and which in principal has a reach far beyond any existing medium. So there's an enormous number, it's one of those VEN diagrams of overlapping regulatory regimes that we have to deal with as an industry. And I think obviously the two key ones are media ownership regulation and telecom regulation.

So let me just summarize the points that I've made here. I think that it's clear, and a lot of these points actually that I make in this paper, to the extent that I can, they're Europe-wide. Often the numbers and the figures don't exist for this medium yet, so much of what I'm saying applies very much to the U.K., which, as the largest Internet market outside the U.S., is naturally not 100% representative of the European continent. But I think that it's the feeling in the U.K. that we're very much the vanguard of the European experience.

So the U.K., thanks to Margaret Thatcher, going back quite a way now, does lead in liberalization of telecoms and media ownership. I think the media ownership element, that's a bit moot. I mean, if you look at the Italian model you might find something a bit more liberal, if that's the word. And telecoms, we saw a U.S.-style deregulation. The element that was missing is that the state monopoly, which used to be part of the GPO, the General Post Office, but was spun as British Telecom. The [inaudible] wasn't split up, it wasn't split into local and long distance. Or, on any other terms, it still operates to this day as a monolithic company. But in other ways it was very similar to the U.S. deregulation of telecoms.

The long distance/local split is observed. So you'll see, for instance, that the monopoly regulations in each of those areas are different. So, for instance, until very recently there was no competition in the local loop toll. BT was dominant there. In the last year or so we've begun to see licenses issued — well, the licenses have been issued for ages, actually. We've begun to see players get into the local loop in the U.K. in particular. Now, this is just beginning all across Europe. I think, in particular, the Scandinavian countries are pushing forward to telecom liberalization in a grander way, in a more purposeful way.

So, for instance, there has been competition in the U.K. in long distance for some years now. It's a pretty ruthless business, and the chief competitor to BT, a company called Mercury, which is part of Cable and Wireless, has suffered worse than expected profits in that area.

In the local loop we've got providers like a company called Energess, or a company spun off from the National Grid, the people who operate the electricity pylons in Britain. They've now started getting involved through local partners with local telephony. And the other [inaudible] players there are the cable companies. Now, I've got a slide later on, where I talk in a little bit more detail about cable.

But the key difference here is that in Britain, and in one or two other countries in Europe now, the cable companies can deliver telephony. You can now get your local telephone service from the cable company. You get a new telephone number, and you get what is broadly reckoned to be a slightly worse level of service, but you can get your telephone service from a cable company now. This is important in Britain for the cable companies.

Now, the key thing about this long distance/local split is that actually for U.K. consumers, historically it doesn't have much meaning, because although we know that we're paying more for long distance we're also paying for local calls. Local calls in Britain and in most of Europe are metered, just as long distance calls are. This has a massive impact, as you can imagine, on the consumer take-up of dial-up Internet services. So, for instance, we've seen now with all of the dial-up Internet access providers in Britain, they have, I think — I can't think of an exception — they haven't needed to use time-based billing as a throttle on usage. They just haven't needed it. So this is a completely flat-rate culture in dial-up Internet provision in Britain.

The throttle here is your telephone bill, which can be pretty scary if you're a heavy user in the U.K. Although I don't dial in from home anymore, my own most recent example is that we, typically in the U.K., pay £10 a month, I think that's in the \$15, \$16 a month area for flat-rate Internet access.

So what's that? Telephone bills come quarterly in the U.K., so that's £30 a quarter, about \$45 a quarter. My last telephone bill, when I was dialing in from home, was £300 for a quarter, which is again in the area of \$400, \$450. So that's a significant throttle on on-line use. So you can't assume the free-form surfing experience is going to apply in the European context.

There have been noises for ages about various local loop providers going to flat-rate or free local calls. Although I think that that's the logical endpoint, we're not going to see it for a little while. It's too lucrative an area. And especially now that the telcos are, some businesses are getting into local provision only, then I can't see it applying for a while.

Now, the cable companies will shift this somewhat. The cable companies are already experimenting, to begin with, with cut-rate telephone calls in the local loop, but secondly with free local calls during certain periods — off-peak for instance. At the moment it's just kind of limited, because you tend to be calling between cable subscribers. Now, that's limited; I want to be able to call anybody for nothing if they live local. But I can't do that right now. So there's a pressure to go flat-rate and free in the local loop across Europe, but I don't see it having a significant impact before the end of the century, really. Not across Europe, anyway. Maybe in Britain a bit earlier.

So the cable companies are key here, and in a minute I'll tell you why I think that they find it so attractive, but that's obvious why they find it attractive. They find it pretty attractive here in the U.S., too, to be in telephony.

To finish off with that kind of regulatory aspect, satellite TV has got a huge presence. The beginnings of satellite TV in the U.K. were, if you think about the background, it was against the background of my last point there where — my numbers might be out of date here — the last time I checked cable TV only passed 20% of homes. Now, the take-up is a lot smaller than that, I think as it is in every cable culture. Actually, I don't know what the actual detail

numbers are here in the U.S. are, and you can tell me that, I'm sure. But with cable only passing 20% of homes, satellite got an enormous leg up.

From the beginning the terrain was supposed to be competitive, and it began as being competitive, and there were two players for a little while in satellite TV in Britain. But now there's only one, and it's Rupert Murdoch, and he owns an outfit called BSKYB, which used to be SKY, and then absorbed British Satellite Broadcasting and took the B's and made that bizarre name, BSKYB. So Rupert Murdoch owns satellite TV in Britain, and, as he increasingly does everywhere in the world.

In passing, I know that there are plans to deliver an IP service via the satellite, the Murdoch satellite system. Naturally, satellite is one way, so they've had to come up with a pretty byzantine way of stitching in the return part of the loop, and I noted that's in on the stocks, and I think it's interesting. Now, the other key thing about it, of course, is that it's asymmetrical, because you can squirt about 64K out that way, but only clicks and e-mail out the other way. That's their thinking, anyway. And that I have an obsession with, because I think the assumption that people really only want to send clicks up the line is probably a mistake commercially in the medium term in this industry. I think people are going to want to put richer content back up the pipe.

Okay. So here's a few raw numbers, but these are so hard to — I mean, I tried quite hard to gather these, and I'm quite thankful to Roger in particular here, who gave me some numbers from one of their surveys, which are adopted through this presentation. Guesswork again... About 400,000 hosts in the U.K., that's my latest figure. Highest growth rate in Europe, I'm told. I think that one other country, Denmark, has higher growth in terms of Internet connections. Typically I think we're looking at 10% or 15% growth per month. Is that right, Roger?

Roger Green: Actually, Steve, there's, there's been a big adjustment to the Denmark figures, in the rates [inaudible] survey. So they're not as high as they were, but they're still, they're still sort of number two on the chart.

Steve Bowbrick: Right, number two on the hit rate. But I think to talk to that point, though, is still that the Scandinavians are a very interesting area here, and is pushing forward into these, into the whole sense of the of wired communities and using the Internet. I'm hoping that maybe we've got some Scandinavian folk here who can fill us in on that later on.

So, Britain, it looks is, is preeminent in growth. And I read a survey not long ago, and it was a consumer survey, but it wasn't statistically sound, that suggested one million connected to the Internet in Britain, one million individual users. Now in a population of 55-60 million, that's a pretty good proportion. But I don't know if I trust that, so I'm taking my 200,000 off for caution, and I think we can look at 750,000 - 800,000 in the U.K. Now, taking that as the largest U.K./European market, you can project from that to for instance what Greece has, with a population of only 10 or 15 million.

And now, just as a point there, the fourth host on the AlterNet was in London, 1969, and it was at UCL. It might have been fifth or third, but it was very, very early on. And I think that there is a significant input across the whole history of Internet from Europe and in particular from the U.K., because of that early connection, from the U.K. computer science community. And if you look at the engineering task force and at the other administrative bodies now, you'll see a really significant sprinkling of Europeans there.

Now, this I've called it the "leap frog effect," and I think it has several different meanings here in the European context. I'm just drawing out one element of that here, which I think is important and often neglected, is that this is a bit like — I think people have used this term

when they're talking about developing countries who have to get from a situation of having practically minimum or no infrastructure in telecoms and they need to get forward in the 21st Century here. It's often been said that those countries may do so by going with wireless, with cellular, and with higher technology solutions than [inaudible] and copper.

There's a sort of an equivalent to that in Europe, in that because historically there was a very tiny user base of individual and small business, smaller business Internet users, that meant that there were very few shell accounts. There were plenty of shell accounts in universities, naturally, and in the businesses that needed that. But in the home and in the small business, there were hardly any. So that meant that the consumer access providers — and I don't think I'm distorting this — from the beginning, every single consumer and small business provider, dial-up provider, was selling SLIP or PPP.

Now, I know that that's pretty much the case here too, now. I'm not sure; I mean, we can learn that from you, hopefully. But it really gave the Web a huge boost. It meant that every single dial-up user in Britain — again, there will be a few exceptions there — had access to the Web from day one. Now, if you compare that with global figures, I think that's quite impressive. And it's the case almost all across Europe.

Just in passing, when the "leap frog effect" applied — it's just something that somebody brought up to me just beforehand, which I'll cover in a second in a little bit more detail — is the sense that the commercial on-line services, the majors, the global ones, the U.S. ones, having had no major presence in the U.K., have essentially been bypassed in the U.K. and across Europe. And there, the risk for the on-line services is that they may remain bypassed, and people may cut straight to the Web.

Right, okay. Just a little bit more detail on that cable thing I was telling you about earlier on. There's a lot of lessons that come from cable and the way it's been pushed forward in the U.K. When cable was opened up in very recent years — we're talking only about during the early Eighties — when cable was opened up in the U.K. in particular, the franchises went — I think more than half of the franchises, I'm sure if this is still the case — went to U.S. companies or companies involving U.S. interests or Canadian interests. And that's still the case, I think.

So what happened is, because the regulatory climate suddenly became so much more favorable to those businesses, U.S. and Canadian companies came to Britain and used it as a laboratory for services they were not yet allowed to deliver here in the U.S. Telephony is a perfect example. From the beginning, these companies were allowed to offer telephony. It took a while to wrap that up, but it's now — I don't know of any cable franchises that aren't delivering telephony, though there may be one or two.

So we've seen Britain operated very much as sort of a hothouse for the cable companies, and for their revenue models. Now, the thing about telephony, naturally, is that in the most — I don't know if it's the most — but a very highly debt-laden business, cable TV telephony brings you quarterly revenue very quickly, and for relatively limited or a tiny investment. You've already got the cable going in there. So it's something the cable companies embraced in a big way. I know that they're on the verge of that here in the U.S. too, and it's beginning to happen with regulatory changes here.

Now, what's exciting from our perspective as an industry in Britain and across Europe is that the cable companies have now got their eyes on other high-margin products that they can start to deliver. Now, I think we're seeing this everywhere, or where cable has a significant presence anyway. But it's worth reiterating that cable TV in many markets still hasn't reached its target. In some cases 40 years on from introduction, targets have not been reached in terms of penetration.

In the U.K. this is especially the case. We were supposed to go crazy for cable, and we didn't. We haven't been buying it in a big way. And churn rates are enormous. Free trials are

very popular, cheap trials are very popular, but the churn rates are very high, so people drop those subscriptions early on.

So in an area like that, in a field like that where revenue is so hard to come by, the newer, higher-margin products that the cable companies already know that we want are going to be very important. So there are one or two trials in the U.K. at the most for delivering IP via cable TV networks. And with the cable modems now just coming into mass production on this side of the Atlantic, I think mainly that's going to be really vital. And I think it could make Rupert Murdoch's asymmetric satellite delivery thing look a bit silly.

Okay, let's have a look at how on-line shapes up in the U.K. It's starting with the Web. Eighty access providers is my latest number, but I bet you anything is more than that by now. What do you think, guys?

M: It's 112.

Steve Bowbrick: Okay, 112 access providers in the U.K. The U.K. is, again in this area, absolutely the hothouse. Even large countries like Germany and France have a fraction of that in terms of businesses out there delivering IP over the telephone. Now, if you add in to these largely dial-up providers, those who are delivering specialist corporate account activity, this is a very exciting activity. And it doesn't look like it's hit saturation yet, although we're going to see massive sort of conglomeration, and all those small companies are already beginning to collapse together as they cash out.

Now, I think we've got local dial everywhere. There are probably bits of the U.K. where we don't have local dial, and there are certainly enormous parts of Europe where you don't have local dial. But I think there's local to the Internet everywhere in the U.K. Isolated corners like the Shetland Islands or somewhere may not have local dial yet.

Now, those companies literally spend the... you've got local dial where you live?

M: We've got [inaudible].

Steve Bowbrick: Good, that's good. Oh, and in the Shetlands, too, excellent. That's good. I'll tell you where the Shetland Islands are later on.

So, these, I think as in the U.S., these companies literally span all the way from the tiny mom-and-pop outfits to BC itself, the monolith, who very recently launched a service, a consumer Internet service which is selling direct, and also will resell or will be resold for them around the country. Naturally it took them a long time to come around to it, and all of the small providers were immensely relieved when they saw that BC's offering was really their own offering. You'd think that somebody who literally owns the telephone network could have delivered something exciting from day one, but they were incapable of doing that. So it's been a disappointment.

Now — and also I may be distorting it here — but I think we have V.34 everywhere now. I mean, every provider as V34 and so that's the standard now, I think. V.34 is 28.8 kilobyte per second, dialing in. I'm sure you knew that.

Ivan Pope: Except CompuServe outside London.

Steve Bowbrick: Except CompuServe outside London, okay, where you're still dialing at 2400 or so, or something like that. Yeah, that's right. Okay.

You know the phrase — it's an old phrase, but there again, I think U.S. companies see Europe and [inaudible] in the U.K. as a place where they can conduct experiments, and where

they can regard it as a little bit of a playground with slightly less of a regulatory burden. You know, in some areas there's actually a stiffer regulatory burden, but they may not know that yet.

So in the very recent times we've seen PSI come in and buy EUNetGB. EUNetGB is the British part of EUNet, which is a European-wide, essentially academic — or it started and was founded as an academic network, which has grown to serve corporals as well.

Now, UUNet has bid for another U.K. provider, called [Piepexunipom]. I don't know if that's gone through yet. Has it?

M: Yeah, it's has been accepted, yeah.

Steve Bowbrick: Yeah, it's been accepted, the bid has been accepted, so that's pretty much done and dusted. Now, I'm interested in that deal because of the arrangement that UUNet has with Microsoft in this country is that they deliver up a large portion of their vanguard to Microsoft at certain times of the day for use with the Microsoft Network. I'm interested in seeing if that will go in the U.K., too.

For instance, in the U.K. — and I think in all of Europe right now — the Microsoft Network cannot deliver IP. You can't get through the Microsoft Network to the Web at the moment in the U.K., and I think that this alliance with the purchase of [Piepexunipom] may give them that. But I don't want to prejudge what their intentions are here.

We're seeing similar partnerships going off all over Europe. In Germany, in particular, there is a number of similar partnerships going on and there's room for many more. And I think we haven't begun to see the wave of acquisitions of European properties by established U.S. outfits. And I'm interested to here your input on that kind of movement as we to go the end, as we go to questions and answers.

So... What is there in Europe that is of use to you? Well, let's just summarize those to begin with. I think that Europe has historically been an absolute powerhouse for creative work. In particular, I've just isolated these three areas here.

For design — I'm thinking about graphic design, architecture, fashion, and the rest of it — there's still an enormous resource of those skills in Europe, and their still in enormous demand here in the U.S., as you notice looking around you here. And I think that they will be [in demand] on the Web, in on-line in general.

Advertising. Again, another acknowledged strength of two or three countries inside of Europe is advertising, sophisticated advertising. And I'm particularly gratified to learn from meeting, as I do all the time, U.K. advertising people. They are among the most serious about this medium. They have really done their research, and are committing funds to doing it properly across the board. I'm not saying that every single advertising agency has got anything going on, or even that they've done anything interesting yet, but they're committed to it. And I think this is one of the great strengths of advertising agencies in general in this emerging business, is that they have the resource and the investment, the emotional investment in researching this medium and getting behind it. And they've got people who sit in advertising agencies and don't do anything but research. Right?

And literature. Bill Gates knows that there's a wealth of art in Europe, and he's going around buying it all, he's buying the electronic rights to it all, so that we can have it on the bathroom wall, on that unrolled flat panel that you're going to buy in the future. That's the plan.

So I think that wealth of content that's built up in Europe since — I don't know, 5000 years B.C. or whatever — is an enormous, unplundered stockpile of stuff that we can start to re-purpose and get it onto the Web. I think it's hardly begun as well. You know, in the

Renaissance alone — we could start with the Renaissance, the Renaissance on-line. I can see it now.

Okay, looking a bit deeper, over a bit on the on-line environment to the commercial services. I like to do this comparison. Last year commercial on-line services — this is a bit of distortion, actually, and don't get caught up on this — last year the commercial services in Britain and across Europe broadly were — CompuServe. It's been around since the early Eighties, I think, in Europe, mostly at 2400 in the big cities. It's been slow to get in all the rest of it, but they've been there a long time. And here's the position next year. Some of these are already in place. By next year everyone of these players, and there are more that I'm sure I don't know about, will have a commercial on-line service in Europe. And I've just skipped through them quite quickly, because you may not know about all of them.

Naturally, you know about CompuServe upgrading [the speed] you can get IP across that network; now you can surf the Web by their browser, or the Spry browser that they deliver with the package, or using anything of your choice.

Let's go down the left-hand side. America Online has a deal with [Bertlesman], a giant German headquartered media group. Until all the recent comings together here in the U.S. of media giants, I think they claim to be the third biggest media group in the world. I think they're probably down at fifth or sixth now, but their alliance with America Online brings a wealth of content, including things like BMG and RCA Records, Arista, and a lot of European magazines and book publishers. [Bertlesman] brings that together with America Online's delivery platform. I think that's going to be quite exciting if they can ever get it out, because it's taking a while.

Now Delphi, they've been around for a while, actually, so this is part of my distortion. I think they were here a little longer than I'm suggesting. But their future is as yet undecided, and obviously it's being written. I should have put MCI there, shouldn't I? Because of the recent Murdoch/MCI collusion.

[With the] Microsoft Network, naturally they're in place, but they have that problem with not being able to deliver IP yet.

BT, I told you about that. BT has their own on-line service upcoming. Again, a bit of an unknown quantity right now, and in principle that will be Europe-wide.

Europe Online is a spectacular "euro-pudding," as we like to call it. Something like thirteen, I think, or twelve or thirteen different European media owners have got a chunk of an outfit called Europe Online. [Berde], [Matarachet], [Pierson], and a bunch of others I could never remember. They've got it into their heads that their wealth of content will guarantee them some kind of presence in this new medium, and they've gone and licensed the AT&T Interchange software, formerly Ziff. What was it called? Ziff Interchange, that's right. Yeah, since AT&T has changed. They've licensed that. I think that's a mistake; I don't know what you think, but I think that's a mistake. So they will have the Web down the line sometime, but not for a little while yet, just as they were in the U.S.

U.K. Online is one of many local variants with Olivetti money behind them. There's an Italia Online, for instance, and U.K Online is just one of many variants under that umbrella. It's interesting because it's delivered via the Web, as is, I'm told, the BT product and the Virgin product. Virgin was bound to get in there sooner or later, weren't they? We're going to see an on-line service branded version quite soon. And again, in principle, it's Europe-wide, delivered by the Web.

eWorld, of course. I've put them in brackets because they're a bit sad at the moment. They just essentially folded, but they're turning their product into a Web site, essentially. I think they should have done that a year ago. They've done it now, which is probably about a year too late. A bit sad.

Okay, so that...I think we've got there, let me look, there are one, two, three, four, five, six, seven, eight, nine, ten, eleven players in European on-line [services], not counting the local variants. No, ten. Ten plus the local variants. That's an enormous number of an enormous richness of on-line services out there. And the content of what I was saying earlier on, every single one of them may have missed the boat, which is tragic, because people are already wholesale surfing the Web.

So who's actually developing content in this market? I've got three categories, which are a bit arbitrary, but let me go through them. I just picked out a couple here, the *Telegraph* and the BBC, and names that you might have heard of.

The *Daily Telegraph* is a national daily paper in the U.K. They have a service called The Electronic Telegraph, which is a Web service. In many ways I'm critical of it because it's a fairly — well, it's a terrible thing to say, I suppose, but it's a fairly crude re-purposing of their daily content, and has not brought to, or not quite yet, brought anything of the Web to that content. But I think that's changing as they go along.

The BBC has a limited presence out there on the Web right now, and I mention them because I think they're interesting, given their public service. What they can do on the Web seems so far to have been held back somewhat. And I think that I'd love to see the BBC deliver something really rich and global, much as they have done in radio for years. But they haven't been able to do that yet, for whatever reason.

We've also got a couple of other media owners on the platform here. Roger from E-Map, a magazine publisher, and then Stuart from another magazine publisher. So these are U.K. players, and naturally there are the same types of outfits across Europe that are doing this. The corporals I've mentioned here; Lloyds Bank has looked at it, so I did [inaudible], I'd be lying to you if I told you that I didn't put them in there because they are clients of ours. They are clients of Webmedia, so I put them in there.

[Tape change]

Steve Bowbrick: Because this is what we're taking them towards, and what businesses like us are taking them towards — actually delivering viable, useful, stand-alone content via that unique URL www.luftansaco.uk, whatever. And that's the model that we're trying to move towards there. And the agencies I've mentioned that have global presence, [Coodean] and Ogilvy & Mather are already delivering — [Coodean] are actually a subsidiary KHBB — are delivering lots of content on-line for their clients.

Other players on the Internet are CIA Media Network, [Lohow & Spink] and a bunch of others in the U.K., all major ad players.

Now, their model is a different matter. How are they approaching this is something which we as an industry are very sensitive to in the U.K.; and I think that again I've used the same three categories, so let's look at how in each case they are approaching this medium.

I think, given their investment in the Web, that we can probably exclude the media owners on the platform here from this category. But the media owners broadly, especially the ones I described earlier, seem to think of the Web as like a television without rules. There's no regulation yet, so let's just use it like TV, let's use it as a one-way medium, let's squirt the same kind of content we're already delivering out via this new channel. We're seeing that here in the U.S., too, but we're also seeing — because there's a lead in this country — you're also seeing the enrichment of that content with Web's specific material. It hasn't quite happened yet across Europe.

The corporates. They've still got the billboards on the superhighway, on the "information superhighway" model. Our challenge as an industry, working with corporals, is to

convince them that what they have is something much richer. What they have is the opportunity to speak with their customer base and with prospects, and to have a conversation with them in a completely unparalleled way, in a way they could never have done before. And while we're just putting out banner style ads that lead to a page of more banners and text specs for the car, or whatever it is, then I think we're not exploiting the full potential of this medium. We need to be using it to have a conversation with the visitors to our sites. This is my priority one. But that's just beginning.

So again, for the agencies, the problem with their model... You can see what I've done here is isolated the problem with each sector's model, in that they are often coming from the perspective of a mass market. If you have been out marketing consumer supermarket goods, it must be very hard to get out of that mind-set. We're working very hard to do that and to get people around to the idea of one-to-one communications.

Again, I think that will come up in the Q&A, I'm sure. And I've used up way too much time, so I'm going to try and get a little bit faster here.

Cultural differences. Big, big point, isn't it? I've just isolated four here, and they're pretty prosaic. I'm not even beginning to talk about real cultural differences here; I'm talking about cultural differences that are out in this medium.

In the media landscape in Europe, this doesn't apply, But broadly, and especially in the U.K., it has a very deeply-embedded public service [inaudible]. So, for instance, the BBC is the perfect example here. There's a sense that the people perceive, broadly speaking, the BBC and other media owners across Europe as delivering a public service, delivering something which is historically paid for out of your taxes. So that's very deeply embedded. It needs to be worked with gently. The "this is where the advertising leads" model may need some work, because if ads are too dominant in your Web site, or if your commercial message is too dominant, you may find that it falls on unreceptive ears.

Now, I have said that there's no concept of "paid-for" programming. The idea that the advertiser may own the content, which is something which has a much greater presence here in the U.S. — that doesn't have any currency, really, in the U.K. or in Europe. It's been the case that the media owner owns the programming, and the advertiser gets the slot parceled out by the 30-second chunk. Now, that is a model which the Web, obviously, completely overturns; and what I say to those corporate clients, like I was telling you just now, is that this is paid-for programming. You own the channel, you can deliver anything you like out through that channel, and you own it forever. Now, that's something they're just beginning to get their hands around. But the consumers may take a little bit longer to adjust to that.

Weird funding models. We really do have some weird funding models for the media in the U.K. I'm really fond of saying "if I told you that to watch the TV in Britain you had to pay, you had to buy a license from the government and that it costs \$150 or thereabouts, and that there are people in detector vans going around in the streets with these fake aerials on the roof spinning around, supposedly detecting your TV, and they claim to know what you're watching and everything..." It's really scary." We have this bureaucracy dedicated to taking the license fee from users. And the license fee pays for the BBC. It's called a television license, but it also pays for the radio. That's weird. I can never get my hands around that at all.

And there are a bunch of equally byzantine and strange funding models across Europe that you're going to have work with. Now, a great thing about the Web is that you start from scratch. I don't think there is anybody in Europe who operates a modem license, that's probably a hoax. But that's the equivalent of what we're talking about here. To have a TV in Britain, you have to have a license.

Okay. We've got a cynical audience. I think I've brought along four particularly good representatives of that audience here today. You know, it's only partly because two of them are

press. They're — cynical is probably the wrong word. Maybe skeptical, maybe overly-critical, maybe a bit resistant to your wiles, is something I think you're going to find, especially in the U.K. I know it's a bit of a classic of the English and British temperament, but I think it's also fairly widespread across Europe. You may not find that you're so unquestioningly received.

All right. I'm just going to work around to a finish here. So what do we actually need in Europe, what do we need from the U.S.? This is like a cry from the heart, you know. These are things we really want. Okay? And we know that you've got it. So we want it now. Okay?

So we want bandwidth. Now, we've got bandwidth, there's bandwidth all over the place in Europe. The Webmedia Web server lives behind a T-1. Now, that's pretty fast. But the infrastructure isn't there. We need more bandwidth. We need... Now, BT owns it all, they've got all the fiber under the ground, but they're not delivering it fast enough and they need a bit of a kick. So we need some people across Europe to be bringing bandwidth with them. They can buy it and license it from the people who already own it. But we need interesting entrepreneurial ideas related to bandwidth and infrastructure now, please. Okay? And I'll be giving our cards afterwards if you want to come and deliver.

Now, technical know-how. Although, as I said, the Europeans started significant input into the Internet and it's history, we know that the focus is here in the U.S., and we'd like to get a hold of that. Again, we want, we don't want the Marshall Plan, we want, we want to buy it, and we're ready. Okay?

Now, the entrepreneurial drive is something which is not uncommon to this business. This is not peculiar to this business. It's something that we need, and we can get a hold of it from you in partnerships. So that's — come on over. And aptitude is the key. I mean, we're just spending time at this event, and the aptitude of this industry is really desirable for the industry. And we'd like to see more of that in the U.S. — in the U.K., and in Europe.

But what do you get in return? Okay, you get the creativity I was telling you about earlier on, which is a not inconsiderable resource. The EU is 300 million people, not all of whom are creative. I haven't met all of them, but some of them are really creative.

Audiences — there's a lot of them. I've kind of restated myself there, haven't I? The EU has 600 million eyeballs, and growing. And with fifteen countries now, we can expect a lot more soon.

And also the content itself. This is already on the Web in Europe, so look for European resources on the Web. Next time you're sitting in front of *Yahoo* or something, look for European resources. There's already loads of exciting stuff out there. What it often lacks is a business model. It's great stuff you've seen that here in the U.S., too... what it often lacks is some sense of how to get this to people, how to market it and how to package it.

So this is what you get if you come over, essentially. I think that this market is growing. The population is growing, just as it does here in the U.S., but it's got the unique property, I think — which the U.S. broadly doesn't have — of actually growing physically. It's moving East. We've got the tragic sort of bottleneck of Yugoslavia right now, for, not just for business, but for European culture and history; but in the market, Europe is still growing East. And you wait till it absorbs Russia. That's going to be an extraordinary moment. It may be a few years off, but I anticipate that the EU will be 20 countries by 2000.

This makes it, I think, the most diverse market in the world. I'm sure that the folks from the various Asian tigers would tell us otherwise, but I don't think of that as a significant or a sufficiently coherent market yet. Europe is a much more coherent market, and very, very diverse in it's needs. So if you have a mind to the kind of niche product that works on the Web, Europe is a great place to work that through.

The trade barriers are effectively down. There is a local resistance to this; you try importing a car into Greece. There are local problems here, but it is broadly an open market, and it is immensely investment-friendly, especially in my corner of it.

So this is how you can actually do it. These are the practical things you can do. You can get partnerships going. Now, that doesn't mean buying a U.K. or a European company, it means something more sophisticated than that. If you want to you can get a partnership going, you can license your content product for Europe, or for any other territory for that matter. But when I look at *Yahoo* and I see the ad across the front there for Saturn or something, it really galls me. It's meaningless to me. I can't buy a Saturn in the U.K. There's a terrible gaping hole there. License your content to someone in the U.K. who can make sense of it for you.

There's lots of content. Let's source your European content. When you want to speak to Europeans, get the content in Europe. I know that's stating the obvious to some extent, isn't it? But there's lots of it, and there's people prepared to do it.

And get yourself a distributor. If what you have is a product — and I don't mean a software product or a hardware product — if what you have is a product, a packageable, shrinkwrapable, get-your-hand-aroundable product, find somebody in the U.K. who can OEM it or distribute it for you, or in the rest of Europe. I keep saying U.K., don't I? I'm a terrible chauvinist.

To finish off I'm going to tell you about this trade body. It's the IDA. I'm on a committee for this outfit, and so is Stuart on the end there. It's a trade body for the commercial Web. It actually comes — the name and the original IDA comes from the IDA here in the U.S., started up by a fellow called Joe Andrew, who's now with GNP Computers. He started the idea of the IDA in the U.S. I think the U.S. is too big a country so far, though, and the body in the U.S. hasn't achieved the focus it needs yet.

Over in the U.K. it's much more compact, it's a tiny little country, about 800 miles from top to toe, so we've been able to bring the industry together much more quickly. And these are the three groups that we're speaking to in the IDA: the media owners, the production houses, and content developers, [as well as] the ad agencies, and they're already very much a part of that. All of the significant players have joined up. So if you'd like to know about that in particular you can ask me or Stuart on the end of the panel there afterwards, or during the Q&A.

And with that I'd like to finish up, and thanks for your attention.

Ivan Pope: Okay. Each member of the panel is just going to take a few minutes to give their perspective after Steve's comprehensive [analysis] of the situation in Europe, and then we'll invite questions from the floor. So if we could have Stuart Anderton first, from Future Publishing.

Stuart Anderton: Is this working? Yeah? All right. I'm going to be an awful lot shorter than Steve. And I should also point out that I was only asked to join this panel a half an hour before we started, so it's not going to be too coherent either.

My name is Stuart Anderton, and I work for a company called Future Publishing, which is the magazine publishing arm of the Pierson Group, Financial Times, Penguin Books, Adams & Wesley and so forth. And we also publish two Internet-based magazines, or magazines about the Internet, which are three of the best selling magazines in Europe. And we also run a Web site, FutureNet, which is in the top five Web sites in Europe and in other either the busiest or the second busiest commercial Web sites in Europe. It's difficult to say without actual figures. That's where I'm coming from.

I'd just like to re-emphasize a couple of things that Steve said, not to disagree with any of it, really. One thing that I would emphasize quite strongly is that certainly northern

Europeans, British, are much more cynical about the Internet and the implications of the Net than it would appear that most Americans are, as far as we can judge from *Wired* magazine, anyway.

The concepts like Netscape 2.0 are considered pretty laughable in the U.K. People find that stuff amusing. And the implication of that is that, well, the Internet may be a global medium, literally, in the sense that you can communicate one part of the globe to any other, but it is not a global medium in terms of content. *Wired* found that out the hard way in producing the U.K. version of the print magazine, which despite an absolutely unprecedented media blast when it launched has not done very well.

And something I come across day-to-day in talking to companies which are multinational companies, is sort of saying, "Well, when are you getting on Web in the U.K.?" And they say, "Well, we're on the Web in the U.S." And that just doesn't work, the content is wrong, and also just such technical things as the bandwidth is wrong. The bandwidth between the U.K. and the U.S. is extremely poor. Steve may have a 2 megabyte line into his office, but there's only barely 2 megabits across the Atlantic. So the U.S. sites run extremely slowly from the U.K. So it's not enough to just put one central resource up; you need to mirror, at the very least.

The main thing that's going to happen in Europe next year is there's going to be absolute all-out war on the service provision and on-line services market. As Steve said, basically last year there was CompuServe, there was also eWorld, but nobody signed up for that. The biggest single player for a long time was actually a dial-up SLIP PPP, an access provider called Demon, which has around 40,000-50,000 users in the U.K. That compares to CompuServe's probably 150,000. So you see the proportion of people with direct Internet access is very much higher.

But the overall level of penetration is actually very low. Next year the marketing budgets of the companies which are trying to get trans-European on-line services together are huge. And so Richard and myself are wringing our hands, really, at the prospect. But come January or February of next year AOL will be launching, Europe Online will be launching. Much of the network at the moment in the U.K. and Europe in general is not a viable service, but it will become so probably by the middle of next year, and there will be an immense battle for people's on-line Eurodollars.

I think, really, the only other thing to say is that the state of Web development in the U.K. and in Europe in general is behind that in the U.S., but only behind on quite a short curve. We'll be up with you soon, as I'm assuming [inaudible] growing. But we're working with very limited resources compared to what's available in the U.S. My Web site operates on probably less than 10% of the resources of something like *Hot Wired*, which is who we're trying to compete with. And I think that's true broadly across Europe, which I guess you could say gives you an opportunity to break into the U.K. and the European markets while our resourcing is still light.

That's about all I have to say.

Ivan Pope: Thank you, Stuart. And now I'd like Joe to say a few words.

Jo Mosaku: Right. I'll introduce myself. I'm an independent consultant. I am not going to plug any particular company while I'm here, apart from myself. Basically, the U.K. scene in respect to the U.S. scene is very different in terms of attitude. Business leaders in the U.K. are now coming around to the idea that the Internet is actually a legitimate medium. But it hasn't been so, well, for the last year or so, and I think in the next year we'll see more activity in terms of attitude towards the Net being something that you can actually use, and not being something that's a throwaway fad, a passing phase.

The companies I deal with see me as their eyes and ears, and I spend a lot of my time in the U.S., primarily researching what's going on here. And basically Steve mentioned that Europe has a lot of creativity. We have a lot of creativity, but we seem to lack technical creativity, which I think is vastly prevalent in the U.S., where they have a much more sophisticated uses of technology, and where it's been put in databases to the back-end of Web site searches.

We operate from Europe, and my [inaudible] is primarily in the U.K. And that is something which I think we need to explore further. We need, at least, to have more of the technical creativity from the U.S. perspective coming to Europe. And maybe we can export to you some of our traditional creativity, that in the other direction.

I'd like to add further that the attitude to on-line services is very different. The French have had a system for a long time called MFL, and so the concept of the Internet — again it's a predominantly "U.S-centric" medium to them in a foreign language to them. You know, a lot of the people in the U.S. are producing multi-lingual Web sites, and this, again, about focusing on marketing to Europe; you have to bear in mind that European people are quite proud of their cultures and their languages, and they find it a bit patronizing to click and see *Yahoo*, and have an ad for a Saturn or some computer distributor in the U.S., in Ohio or whatever. And this doesn't make a lot of sense to them. It provides them with a reticence to get involved with this U.S-centric medium.

They want — they need more focus for their own local markets, so if you are from a multinational organization, get involved with the local people to actually provide you with the expertise and the knowledge of the local markets so that you can actually reach people who will then be more receptive to what your message is.

About that again; I mean, the advertising agencies have been looking at this in the U.K., and there have been some interesting projects that have been put around them. Ogilvy & Mather have done a thing about six months ago with Guinness. I'm not sure if you're familiar with what Guinness is — it's the Irish drink, it's brown, dark, with a creamy head — where they distribute to the screen-saver on their Web site, which I've lost count of... [Steve], You know, you're the man with the statistics.

Steve Bowbrick: They have more downloads, I understand, than people could have conceivably accessed the Web site.

Jo Mosaku: There you go. So that was a great marketing campaign where they distributed for an alcoholic beverage. And there are restraints on where you can actually advertise alcohol in the U.K. as well. So again, being the Net where there are very few rules and regulations, it was an interesting exercise.

So I think we have this creativity in the U.K., but there is a lack of, as was said, resources. And I consider it to be the artificial high price of products of hardware and software, and people don't actually own the kit to get on-line, or they see it as just far too an expensive proposition for them to actually get involved in a purchase of equipment like that, especially for personal home use. This, again, is a problem associated with the EU, as it's called now. As a single market it still operates, I think, very much as very separate small markets, and not one unified market. Again, that has to do with historical, cultural, and various issues, and just the nature of the way people want to protect their own local markets.

So I think the U.S. companies perhaps are very aggressive in marketing their products in Europe, but they have to bring their price down and start to look at Europe as a bigger market, at 300 million, so we should be getting the economies of scale. But we're tailored to move out, to getting that way. You know, there are local sensitivities.

And I want to comment further on a few other things, like entrepreneurship and marketing. These things are not as sophisticated as they are here. I mean, maybe not so much sophisticated; I think Americans tend to have more of the drive the enthusiasm for the new, for technology, which is lacking. We need more of you to come over and fuse these people in Europe. I spend my time rushing backwards and forwards, and they think I'm a mad person, saying in the Net you can do these wonderful things. And they just don't buy it, they don't see it. It's probably part of the education system in Europe, where technology is not promoted as being something to aspire to; I think it's deeply in the U.S. culture that technology is something we want to have, especially in business where it's seen as a competitive advantage having the quickest, the fastest database computer or whatever so you can deliver to your market quicker than your competitor. This is the way business operates in the U.S.

And in the U.K., there are companies who are focused and do have that attitude, but in the main there's a reluctance to think that way. And I think we need, again, more of you to come over and exchange your ideas with the people there. I mean, I'm a one-man band running backwards and forwards. I can't shape the opinions of 300 million people by myself. And I think the idea that Steve mentioned earlier about strategic alliances — there's very much a huge market for that, and people are waiting and ready to do business with the U.S., but in terms of — not master-slave, but more as partners; because there are a few huge conglomerates out there who are pretty aggressive, and are prepared to squash their partners. I think a more friendly partnership would reap dividends within Europe.

I think, before I start repeating myself, I'll let someone else take over.

Ivan Pope: Thank you, Joe. And then I'd like Roger to introduce himself.

Roger Green: Thank you, Ivan. Thanks, Joe. I suppose I'm the final speaker from this panel at this time. Is this microphone on?

M: Yes.

Roger Green: Okay, yeah. It's just that I couldn't quite hear myself. I'm sorry, unlike Larry Ellison we'll forgot the dry ice for this presentation, for any of you that saw Oracle the other night. I'd like to summarize, really, some of the things that have been said and just inject a few of my own thoughts or prejudices, or whatever you care to call them, and finish up with some practical suggestions that you can take home or back to the office and do later today or tomorrow to kind of increase your understanding of the European market.

Now, the first thing I'd like to say, and in fact Joe did allude to this, is that you've been presented this afternoon with a very kind of a British-based — or in Joe's case, British and U.S.-based — panel. Don't forget that there are some other countries out there. In particular, if you want to see some distinctions, and some big distinctions to what we've been talking about, look at France or go to France and see what's happening there. At the moment, France is still, and has long been, the most wired nation in Europe. For many years now, many, many households who have had access to France's telecom Minitel service, and that gives a whole different perspective on the use of on-line services. It's the other end of the spectrum from Britain, where there hasn't been much of a tradition of on-line service use until recent years.

So having prefaced my remarks by saying "stop listening to us Brits or part-Brits," then I'll go on and talk to you with a British point of view.

First of all, just to explain, I'm the publisher in the U.K. of this magazine, *Internet* magazine, one of the top-selling titles in the U.K. (It's a private joke there with my colleague on the end of the table.) And in the course of my activities as a publisher of the magazine for the

last year, we've had the pleasure of working with a number of well-known Internet market companies such as IBM, Silicon Graphics, CompuServe, and Netscape, and as we help and work to develop the market in the U.K. it's become clear that it has certain characteristics, and there are certain things about the U.K. market. Now, remember, this is one which is probably more similar to your own than many of the others. It's certainly more similar than France, and probably more similar than Germany. But there are some distinctions between the way things are in the U.K.

Now, the first thing that surprises people, especially people I've been talking to here, is that the U.K. Internet, or the commercial Internet market in the U.K., is growing incredibly fast. There is a great deal of activity there. Steve mentioned the large number of access providers that are there currently; when I left London on Sunday there were 112, there are probably about 115 by now, because it's been growing that rapidly over the last few weeks.

Now, it doesn't mean that they are all substantial and successful organizations, because as London reports coming out in a couple of weeks will say, probably most of those companies have got 200 or fewer customers. And it's estimated in the U.K. that if you want to be successful as a commercial access provider, and that's your main business, you need about 20,000 customers. So some of them have got a long way to go.

The other characteristic, though, and something that we kind of expect to come — I'm referring back to one of Steve's slides about what are we looking for from the United States — [is that] we're looking for some handy, instant tips about how to run a decent Internet provider service, because of the 110 — or a few of the 110 — that have got more than 200 customers, it has to be said not many of them are very good. And indeed, it should also be said that some of the are quite useless. You would be shocked if you were used to the standard of, not only the standard of the technical service but also the standard of the marketing, the standard of the subscription renewal programs and so on, that you're used to here. You'd be shocked at the way it is in the U.K. at the moment.

And even from the technical point of view, one of the things that we do in our magazine which isn't done here — perhaps because it doesn't need to be done, and perhaps here it's assumed that provider services work — one of the things we do in our magazine and have done in the past couple of months is to measure the services. So every 20 minutes, seven days a week, around the clock, all of the main providers, and certainly all of them who have got more than 200 customers, are dialed from our test labs. And, well we start of testing whether there's a connection or not, and anyone who's interested can look at our latest set of charts. And for most of them, they go like that. Most of them are like that.

So, the market is very, very fast-growing, there's a lot of action there, there's going to be great scope for it to be done properly, or at least in a way that you would recognize as properly.

Other indications of action in the U.K. are "cyber cafes." Arguably the world's first cyber cafe was opened in London about a year ago. There are now about 25 in the U.K. Again, as I think as Steve mentioned, we're talking about a fairly small country, about 800 miles from end to end, with a lot of activity, a lot of public awareness and so on.

So if you're a marketer of Internet-related products or services, you might write, and we would invite you, of course, to come and sell your wares there.

I imagine that many of you have come to find out some facts and figures about the European market. One of the things that you will rapidly discover, and as I was saying to you... A very honest consultant who has been calling me over the past few weeks is working on a business plan for a famous name Internet software company not presently active in the U.K. There is hardly any information; there's hardly any hard information about the market available in the U.K., let alone some of the other countries which have still to catch up.

If you are looking for information about what's happening, I invite you to contact me or to contact Stuart, who's the publisher of another respected publication there. We can tell you about the market. Indeed, my particular magazine has, because there's a dearth of research, we've produced some ourselves about what's happening in the U.K., because we were being asked so often for it.

If I can just pull out a few of the distinctions between America and Europe in the interest of kind of summing up... As Steve mentioned early on, in the U.K. and probably in other countries where Internet use becomes widespread, people who are dialing up from home to use the Internet are going to constantly be under the pressure of knowing that every moment they're on they're spending money, despite the flat-rate charging from the providers. Now, that's going to make users in Europe very impatient with sites created in countries such as this one, where people don't have such time pressures on them.

And of course, the flip side of this is that the content that gets created in Europe by people who are working within that environment are likely to come up with more, certainly faster, more rapid-fire experiences, and maybe ultimately more satisfying experiences than those created here, where bandwidth to the home is cheap and almost cost-free.

And there's a very good parallel that I draw for this, which is that — hope you agree that it's adequate — which is that for many years in eastern Europe some of the very best computer programming was done, because until the recent years, people in eastern Europe have far scarcer computer resources to work for, or work with. They had smaller memories in their computers, they had less storage, and so they were tending to produce very, very tight code, they were not producing the “bloat” kind of applications that one began to see with the rise of Windows. So because of those constraints, I think people in Europe are going to produce often more interesting, and certainly more end-user focused applications, ones that aren't based on the assumption that you've got to have a giant graphic which has got pictures of all of the activities of your enterprise.

Another distinction to draw, as Steve said, is that on-line services are unknown in Europe, apart from CompuServe. So that means that people are going kind of straight to the Web, and they're avoiding proprietary interfaces.

Another aspect of that, of course, is that because publishers and content owners in Europe have been kind of behind what's happening here, you tend not to find publishers' sites from Europe crammed with legacy content, as you might call it, which has been shoveled on over the past few years in the way it has here. And I think you'll find that some of the more enlightened media owners, if we call them that, will understand that there are different ways to work on the Internet than simply to expect people to want to wade through your “shovelware.”

So, certainly it's all Web, really. I share the cynical view that not many, if any, of those proprietary on-line services are going to work. Like Stuart, I'll quite happily accept the money from the promotional budgets. I suppose that does sound rather cynical, but really, the more aware on-line service providers — and notably Microsoft Network in Europe — understand this, and it's one reason why the Microsoft Network in Europe is not likely to hit it's stride until the middle of next year, because the people responsible for it in Europe understand the landscape, where there's no culture, really, of using an on-line service. And over here, of course, people might be persuaded to switch from America Online to Microsoft Network because they tend to think in those terms. In Europe they will not.

So, just very briefly about one or two other things for the future, then I'll give you a list of things to do when you go back to increase your understanding of that rich tapestry that is Europe today.

On a more kind of upbeat note, there is a huge potential for development tools in Europe. If you happen to be connected with a company which produces such tools, or is intending to do business across the Atlantic, get distribution for them, because there is so much activity there. And picking up on one of Stuart's point, publishers generally in the U.K. tend to work with fewer people while attempting to achieve the same results.

[Tape change]

Roger Green:...to make the production of Web Pages more efficient. So there's a huge potential there, so do make your way across the Atlantic at the earliest opportunity. I would warn you to look to Europe for innovations. You, you really should take a look at what's going on there because of the constraints I mentioned; people are going to have to be creative. You know, I think you should look to Europe for kind of the new media empires, which is a phrase coined by our moderators sometime back on a radio program. Look to Europe for some very exciting development.

Finally, here are some things to do to help you look to Europe. First of all, if the show is still open, there are a couple of really interesting products, which was nice to see. One in particular is a Bitstream product that's going to see the light of day in the first quarter of next year, which will make — they say, but I would like to disbelieve them — it will make it much easier for Web browsers to display nonstandard ASCII characters, the ones that Steve referred to early on in his presentation. There's a lot of people in the Baltic, in Greece, in many countries that use unusual characters. Britain's got a few, Germany's got several; In France it's very limiting at the moment as to what can be seen in a simple text application. Bitstream has got a nice solution to that. So if you haven't seen that, go and look at it. If you have seen it, do support it, it will help make the Web more international.

Somebody — and I'm afraid to say I've forgotten their name, it's in a box of releases somewhere — there's somebody, at least one company here, with a multi-lingual browser. Take a look at that, support it if it's any good.

M: [Alice].

Roger Green: [Alice] from....

M: Montreal.

Roger Green: From Montreal, the former Canada, I think, that's — no, sorry, it still is Canada, isn't it? It still is Canada.

Okay, something else to do. If I assume everybody here has Internet access, find five interesting European sites and put them in your hot list, and look at them regularly and see how they develop. I think that the Europeans are going to learn by being a bit lazy. You get a chance to learn from other people's mistakes, and many of them will.

Another thing to do, if you're not familiar with it, if you use a Windows PC, download the screen-saver. It's a fabulous example of European creativity, and I'm not just saying that because a guy that did it used to work for our company. But take a look at that, it's an excellent piece of marketing; an excellent promotion for a dark drink with the white stuff on top, as Joe put it.

Then, finally, things to do next time you are in London. Call me, call Joe, call any of us and we'd be happy to show you around or at least talk to you about what's happening, because it's getting pretty exciting there— although sometimes I wish it wasn't quite so exciting as it is.

Thanks very much.

Ivan Pope: I'm just going to wrap up really quick here, and then see if there are any questions. I just want to end on a really bullish note to say there's a lot of information there, there's a lot of ideas about what's going on in Europe. It's incredibly exciting, and I want to be really upbeat about it. It's incredibly exciting in Europe at the moment. It's like we're on either the up or the down parts of a roller coaster. We're following your car on the roller coaster, and you're up and we're going down, and it's all over the place, as I'm sure you know from here. But it is very, very dramatic and exciting.

We do want a lot of things from you. Obviously, we want your technology. We want your experience of setting up for and running the technology. We want your bandwidth, we want your software. We do have a lot to offer in return.

No one's actually mentioned this. I just want to mention this, for what it's worth. I don't know if it's worth anything. But we have a very close sort of emotional connection with the WorldWide Web insofar as it was actually invented after a European institution based in Switzerland, an institution that is run by various European countries. And by an Englishman. I mean, I know that Englishman is now working in the States, but for what it's worth it's always said that we're very good in Britain at exploiting them. And, there you go. But we do have a very close emotional connection with the Web, and we think we're doing some very exciting things.

Something that was just touched on briefly; we want your capital. We're very bad entrepreneurs in Europe. From my perspective, it's very difficult to enthuse people with the potential and the possibility that we all know is there. So we want your capital to come and get projects running in Europe. Steve alluded to the Marshall Plan earlier, and he said, "We don't want a Marshall Plan." But I think my understanding of the Marshall Plan is that it was actually a loan, and we did pay it all back in the end. So don't worry about that, we do have quite a lot of money over in Europe and you will get it all back in spades.

So I'd like to just now throw it open and see if we can get any questions for the panel, anyone you want to throw a question at and come to some further points. Yes, in the back there?

W: You haven't talked much about language. I realize you're all from the U.K. How important is language and the different languages in Europe in getting such wide acceptance?

[Panel]: I touched on that earlier, actually, and it is extremely important. I mean, to a French person, to read something on the Web in English is an abomination. And I mean, the French...

M: If, if I may just jump in, I just want to make one quick point, because I'm based in Paris, and it's not an abomination. They just won't read it.

[Panel]: There you go.

M: But on the other hand, what you need to realize is, I don't know what you know about the [inaudible], but it's a billion dollar in revenues for people that are putting [inaudible]. And I'm just talking about people calling up [inaudible]. So there's a well-developed, highly profitable, extremely interesting wealth of information on what people will pay for in terms of [inaudible] in just one market. There are 6 million people, and that's a technology that's 2400 baud under that.

When you look at what the Web can do, and what the new technologies can do, there's a huge increase in user ability and usefulness. But there's a tremendous [inaudible], in fact an openness, I would say, on one level, the level of a consumer paying to access information, and paying a lot. So understanding the variations in Europe is actually a complicated and tricky thing because of this diversity, and because the English [inaudible]. But I would not rule out the opportunity to understanding.

[Panel]: Yes, I want to say I suppose absolutely that's why [inaudible] with people in those countries get that local knowledge and that local translation. That will be a very interesting sort or project. Yes?

M: If you can, let me just, [inaudible].

[Panel]: I did try in very limited way to touch on this. Because we're an absolutely useless European panel. Obviously we're an English panel. But we're... If you take a bottom-up approach, if you scour Europe for the rich content that's already there and then absorb, exploit, whatever, that content, then essentially this isn't a problem and the problem goes away. But if you take a centralized CompuServe approach — which I know is breaking down now — but the proprietary approach, and then try to deliver your existing caller content into multiple languages, then that will break. Because it's just too top-heavy, it's just too unwieldy. To take the bottom-up approach, it's very Internet, it's very Web.

M: Ivan?

Ivan Pope: Yes?

M: [Inaudible] doing that?

[Panel]: Yeah.

Ivan Pope: Yeah, yeah. And the Olivetti project, too, U.K. Online, Italia Online, all of those yeah. So, yeah, all of the [inaudible] are focused on delivering their content via the Web. Broadly speaking, that's what they're doing.

M: There's a kind of a fallacy, because what everybody's saying here, from Europe, is that the European market wants content, but they don't want content relative to the U.S. They want language from the [inaudible], not English-based. They're more towards that, and that foreign language is an on-line type of service rather than an open Internet. So I think it's a fallacy here. I don't know what your views on that are.

[Panel]: Well, I'll answer that. I was in Paris a few months ago, sitting in an "Internet cafe," browsing the Web. Now, it's quite strange to be browsing the Web in France, and the text coming up in English. There are a lot of French sites now in French, but primarily 99% of the content on the Internet is in English. So I think there has to be an appreciation that not everyone does speak English.

M: And the thing is, it's the AOL that's going into Europe, and Europe Online. The question is that when those on-line services — not Web-based services, but on-line services— become strong enough to serve the market there, do you think that people will access the Internet and

go into on-line? Or do you think not [inaudible], because all the discussion leads to [the fact] that the European consumer would like something tailored to him, in his own language and relevant to him, without seeing the Saturn.

[Panel]: The fallacy is not....

M: [inaudible]

[Panel]: The fallacy is slightly different. I think the fallacy is thinking that the only kind of valid aggregation of content, or on-line community is an on-line service. We're seeing perfectly valid and useful and interesting content aggregators, community-based approaches, what Bill Gates calls "branded communities" emerging on the Web.

[Panel]: Yeah, I think what the point is whether the distinction between the on-line service and a Web service will break down faster in Europe than it will, perhaps, over here. There isn't the 6 million people in Europe already signed up on on-line services. There's not that user-base already there. And I think we may move more rapidly straight to the next stage of on-line services in the Web, where the distinction really does begin to break down completely, and it's just an access provision, and on-line community, and whether it's served through TCP/IP and the Web or whether it's through a direct modem or dial-up become pretty much irrelevant.

Ivan Pope: I think I'd say the answer to your question is that they want both. People want localized, language-specific content that is from their perspective, literally the [inaudible] is about, they are about the things they are interested in. But obviously people also want access to the huge worldwide content, and that's where the Web does, what the Internet will always score over the propriety services, however good they may be. And so I agree with those points there. Is there someone here? Yeah?

W: [inaudible]

[Panel]: I can comment on that, actually, for business-to-business, which primarily is the area I probably deal in more than in the consumer end of it. An example is Fidelity Investments, a big corporation over here. They have a big Web site, and you can do a lot of on-line transactional stuff, and they're all informational type things. The same thing doesn't occur in the U.K., because this is to do with a lot of the regulatory systems in different countries.

I think there is beginning now, with a lot of the multinationals, to be more of a focus of using the Web as a delivery, and more of a communication throughout the corporations worldwide. Now, how far that's gone down the line, I don't know yet; we are probably doing a little bit of research into how people are using it globally within business-to-business relationships. I presume it's underdeveloped within Europe anyway. I think within the U.S. business transactions are going on quite happily, and people think in those terms. People still don't yet think in those terms within the U.K., and I'll presume for the rest of Europe.

[Roger Green]: Another way of answering the question for the U.K. is to observe that certainly at the moment — and probably for the foreseeable future — most people who are using the Internet or heavy users of the Internet tend to be older males in the house [inaudible] with school-aged children. And that's an impression that's been borne out by research that we've done, but also research that's been done by a consumer research company called NOP of London, and more recently by Continental Research of London, who are beginning to measure

Internet use and the way they produce the industry standard numbers for the satellites and TV business.

Incidentally, you can find links to those places I've just mentioned on our Web sites, the *Internet* magazine Web site. And that's emap.com. Does that answer your question, or help to answer your question?

[Panel]: From my perspective, we deal with a lot of companies in my business, and generally we are dealing with consumer-oriented Web sites. But we are starting to see more of a recognition of business-to-business opportunities. And I think we're looking more with our clients at adding on a business-to-business element to a consumer or even to the Web site that they may already be building, and I'm sure that will lead to a recognition that there is a large opportunity there for business-to-business systems. But I think it's in its early stages.

And I think if you just look at a lot of the publishing about the Internet, both in the States and certainly in the U.K., it is consumer-oriented. I know there are a lot of tools under development that will open up the business-to-business opportunities much more; I think we're, again, we're a bit way down the curve, but the curve is upwards and I think we're going to see some very exciting developments there in the near future.

[Panel]: Yeah. I don't think there are any figures about how many people, income producers in the U.K. or, or in Europe in general have Web access. But certainly I know from looking at the access logs to our Web sites that accesses reach their peak between 9 and 5 on weekdays, by some very considerable way — which we weren't entirely expecting when we set it up. We thought evenings and weekends would be when people would dial the Internet on their dial-up accounts, and that has become the case — so much so that we've actually set up a daily sort of news update that has updates as of 1 o'clock for business people to look at during lunch times. And that's been very popular. So I don't think there's any figures, but certainly I think it's perhaps more widespread than we might know.

[Panel]: Well, there are some great products at this show. For example, [there's one] from BSDI that will make it much easier for businesses to connect their LANs to the Internet, and which indeed is something that's required here. But it's a great product from Berkeley Systems, so take a look at it.

W: [inaudible]

[Panel]: Thanks. Oh, can we go over there? Yes.

M: [inaudible]

[Panel]: I think that's one for Steve.

Steve Bowbrick: I think there's no resistance to doing commercial work and to advertising in a general sense. And I think the thing that I get, that this is less the case now, but when a client comes to visit us they're a corporate or they're an ad agency, and somebody told them you can't advertise on the Internet. And the first ten minutes of the conversation I have to convince them that it's okay to advertise on the Internet.

And I don't think there's any real consumer resistance to the commercialization or whatever, but there's a sense that you've just got to get the tone right. If you're delivering material which is classically a public service in nature, then you'll need to just get the tone of

your delivery right. I mean, I was listening to a radio, one of your public radio stations this morning in the hotel, and there was a sort of a near-hysterical ten minute fundraising section at the end of the program, at the end of each hour of programming. Which, apart from being absolutely amazing, and I wish I'd recorded it, is a very poor match culturally for European public service media. But that's not a very good answer, is it? Somebody else have a go at it.

[Panel]: Certainly in Britain advertising is a lot less intrusive with it's radio and television advertising than it is in the U.K. In the U.K. there are five radio stations which don't carry any advertising at all, and more than that there's local ones as well. There are five national ones, two national TV stations with no advertising at all. And even the two national TV stations which do carry advertising tend to only interrupt a program maybe twice in an hour, or three times in an hour, or something like that — but certainly not every few minutes, and in between the [inaudible] and all the rest of it.

It's, a very, very different model, and I think certainly in the U.K. people just aren't used to intrusive advertising. I heard the same radio program as Steve did, actually. And I was absolutely fascinated; I just listened to this fundraiser, I've never heard anything like it in my life. And it's a different way of thinking about things.

[Panel]: May I just add one maybe final point to this question? But let's think about where we are, and think about what we're talking about here. We are talking about something which is the biggest revolution in communication since the invention of [inaudible] here. There's a whole generation of consumers coming along who hate advertising. And certainly in the U.K., Steve mentioned that the people generally tend to be more cynical and they're not going to take intrusive messages.

If you want to see a fantastic explanation of this point, if you visit our country across the Atlantic, go and see somebody called Sue Little who works for [Mechanairics] in advertising in Manchester, in the north of England. They did some fascinating, dead-simple video interviews with people, customers of a cyber cafe in Bath, and in just a few minutes you'll get that things are going to have to change, even in the U.K. where it has been said that advertisers messages are generally delivered to consumers in a low-key way.

So, call Sue Little in Manchester, say I sent you, and ask to see her video, because it's very revealing about the future. You know, we're not talking about next year, but at the end of this century things are going to be a lot different, and probably in this country, too.

Go ahead. Yeah?

M: I'm just curious, what is the [inaudible] in the U.K. and throughout the rest of Europe?

Ivan Pope: Netscape.

[Panel]: Netscape, which apart from the usual reasons for Netscape, it does have much stronger multi-language supports. It supports [inaudible] characters, and gets pound signs right, and so forth. But no doubt everyone will be using the Oracle browser shortly, because that's not a legacy. Yes?

W: [inaudible]

Ivan Pope: How do we resolve the bandwidth problems in Europe in different countries?

[Panel]: Well, actually, as Stuart said earlier on that, there was 2 megabytes, or roughly, across the Atlantic. But somebody at BT tells me there's now 10 megabytes or thereabouts across the Atlantic, if you sum all of the providers back there. And Sprint and BT have both promised [inaudible], which is 34 megabytes each, across the Atlantic. And that can only be the beginning. There's all the fibers lying there on the sea floor. You know, it's very annoying that it's not being pressed into use. And I think that as an industry we must supply the pressure to get it pressed into use.

For ten years or so now, the historic rule is that everything happens nine months after it's supposed to. But, I think that you can reverse that with the Net and say that everything happens around nine months before you expected it. And so I think that we'll see the bandwidth coming sooner than we expect. But that's not, again, a very good answer, is it?

[Panel]: I think there will be a lot of more bandwidth between or across the Atlantic sea, mainly because up to now it's been the U.K. and European countries buying bandwidth into the States. But increasingly we've met [inaudible], and it will be the people buying bandwidth from the States into the U.K., which costs the same. But the way you're thinking is different. You're used to much higher bandwidth over here, and I think they will default to try to put in much, much wider pipes across the Atlantic than the U.K. companies, always trying to get the very cheapest that they can.

[Panel]: I'd like to answer from a slightly different point of view and say that if you're users are saying it's not good enough, it's not good enough; because the experience you deliver, the speed at which it's delivered is part of the experience. And so if you have people sitting, waiting for a screen to fill up, that's a bad experience.

A way around this, of course, is to have mirror sites in the continents or time zones that you need to be in. Consumers won't wait around to see something that takes ages to load, and certainly once employees or customers or partners have to re-send it, having to waste the time it might take for your organization to tell them what the prices are, or when the contract is coming or whatever...

[Panel]: Yeah, I think with mirror sites there will be a lot more of those in the next few years. And working both ways as well. It's certainly the case in just accessing our Web server internally over our company's Ethernet network; it's fine until about 1 o'clock, when America wakes up. And that's when people start to access our service from the outside, and we can't even get onto our server internally because the level of demand is so high. And so I think a lot of people are going to be looking at duplicating [inaudible], just the same way that FTP resources have had to duplicate, because there was too much demand. Web resources will have to do the same thing.

[Panel]: It's what I should have put it in — it should have been a call to action in one of my slides — [and that is to] mirror your site. There are people in Europe who will help, you know. And just to finish on that, another thing that's worth remembering is that the underlying protocols here, HTTP and IP, and they are in many cases already incorporating a provision for load sharing and automatic mirroring. [Dave Racket] and the other people at the [W30] are very focused on doing that.

As an industry we have to respond to that by providing the mirrors that then the sophisticated protocols can start to work with, and start to deliver automatically. If you connect from France you should, without asking, get the French or the European server. The protocols will support it. As an industry, we have to move to that model really soon.

W: And that's another question also. Is there a number for the Department of Commerce in those countries? See, we're trying to get a number, a number of people to [inaudible] their own [inaudible] so they can connect, so they can all interconnect each other.

Ivan Pope: It's a good idea.

[Panel]: There aren't. In the U.K. we're trying to set the Internet Developers Association, which will provide a way finding independent party people to help build Web sites in the U.K. As far as I'm aware, there's no such resources in the rest of Europe.

M: [inaudible]

[Panel]: There are similar bodies popping up everywhere, yeah.

[Panel]: I would say get on the Web and do some searches, because whenever I want to find contacts throughout Europe, I find the Web a very useful tool, and I very quickly pick up all the contacts I need. So you use the tool. And I would also say buy the publications that these guys are selling, because it provides a very, very good starting point, huge amounts of contact information. And even if it's largely the U.K., it will give you a kicking-in point, and then you can find someone in the U.K. who should be able to find someone for you throughout Europe.

[Panel]: Yeah. And there are no [inaudible] publications throughout Europe. And you know, mine are published in several different languages, and obviously their's are as well.

Ivan Pope: Right. I'll take one over there.

W: You are presenting a panel on Europe [inaudible], is there a reason for that?

Ivan Pope: Yeah, it's a historical accident. I'll pass it to Steve, he's the official speaker here.

Steve Bowbrick: I don't know, actually. I was invited to give a paper on the topic of Europe, and the slot that I was supposed to fill was nearly four hours long. I didn't [inaudible] on my own. So I've rustled up a few Europeans.

Ivan Pope: Who, I might add, happened to be here, because there was no money available to fly people in. We know we don't represent Europe in any way. We're just a rustled up group of people who do have a lot of experience between of, of the Internet.

W: One of you recommended that we look at the Europeans side, how they felt. I'd like you to be the [inaudible].

[Panel]: That's not our own.

[Panel]: There's place in Paris, they have an Internet cafe there, I think it's called Cafe [Opital], and I presume we have the URL for it. But if you look up on the [inaudible], that would be a good starting place for all.

You know, French [inaudible], I know in Spain there's been increased this year, it's just begun, and there's a lot of interest there. And Italy is doing some very interesting stuff, which I think the chap commented on earlier on.

Stuart Anderton: I couldn't tell you the name of a decent site that wasn't in English, simply because the language barrier is just as effective the other way. I mean I don't...

[Panel]: There's the Louvre in [inaudible].

[Panel]: Well, yeah. In terms of an English site that's worth watching, there's one called Anarchie which is quite amusing and changes everyday, and is very British in it's sense of humor.

[Panel]: Sort of tabloid journalism for the Web. U.K. tabloid journalism.

[Panel]: Anarchie, www.anarchie.couk.

[Panel]: The one I mentioned the Guinness was, I think it's www.icl.met/guinness.

[Panel]: I should have told them about that.

[Panel]: If only there was an easy way to register names in the U.K.

The other one to look at — I mean, he didn't say he was ashamed, but I suppose we're a bit ashamed that we're talking about the Louvre site, a very early pioneering piece of work. We're talking about English ones. There's quite a nice one which is music.com, which is an example of a trade publisher for the music industry, and he has got some good stuff up there which I personally quite like. And there's one just gone up for the London Gate Naturalists, very nicely done, a great example of using the Internet to bring together groups of people with similar interests.

[Panel]: I've plowed through the [inaudible] site on occasion, but my French is so bad... There are good sites in the U.K.. For a listing get the magazine called *Timeout*, which only incidentally we built. But also there's a good TV listing just come up in the U.K., which is, again, from the [Yearling] thing, the URL which I can't remember. What's...?

[Panel]: yearling.com, www.yearling.com. Which is the intelligent application of Web technology to a television listing, which is something that should have been done ages and ages ago, and it is good.

[Panel]: I'd like to suggest you keep an eye on the U.K. Internet Developers Association Web site, which has various addresses, but should be at www.ida.co.uk. Oh, sorry, org.uk, I always get that wrong.

[Panel]: It doesn't exist yet.

[Panel]: It probably doesn't exist yet, I'm being told here.

[Panel]: There are a number...

[Panel]: But it will be worth keeping an eye on.

[Panel]: There are a number of British-owned [inaudible], of which I thought [inaudible], just off the top of my head. Actually there's a list of all British commercial Web sites at Imperial College in London, which is www.doc.ic.ac.uk.

[Panel]: Did you get that, did you all get that?

[Panel]: I'll repeat that, it's www.doc.ac — or ic?

[Panel]: No, ic, Imperial College, so .ic.uk.

[Panel]: If I could just wrap this up, there's a good index at www.ukindex.co.uk, which is a nice, searchable index. I think that's enough sites.

[Panel]: Of course, you can always shut down European sites by searching them [inaudible], which is probably the simplest way of doing it.

Ivan Pope: Anymore questions?

W: [inaudible]

[Panel]: Self-publicity here.

[Panel]: All right. Mine's www.futurenet.co.uk.

[Panel]: And yours ?

[Panel]: Ours is www.emap, that's emap.com/internet. I've got a few copies of this magazine by chance, which we'll be happy to give free at a normal price, \$3.50.

Ivan Pope: I'll take one more question, and then, and then wrap this up. Could I take the lady in the middle, there?

W: My concern is with translation. I'd like to see simultaneous translation on the Web. I mean, could we speculate? I realize, because I speak several languages, how difficult from the spoken word to the written word in translations, which seems to be what's stopping us. But will there be anymore to the [inaudible]? I mean, that seems to be our stumbling problem, because we can't talk to one another, we're stuck in English.

[Panel]: Well, I know about a year ago there was a project — now, I'm not sure how sure it went — which the EU was undertaking, where they were trying to develop software which would actually translate from, say, Spanish to English.

M: [inaudible]

W: [inaudible]

[Panel]: Isn't there a CompuServe Forum that does machine translations through it? And also, I don't know the name of the tool, but there is a tool that works over an IP network and does

the same thing. I haven't seen it yet, but I think it's a brilliant idea, especially as a business-to-business application. The idea of offering an automatic machine translation delivered in an hour or something like that, or immediately if possible, which would give you back a crudely translated text which you could then work over — I'm sure it's an exceptionally good business-to-business application. If I could find such a tool, I'd like to roll it into a Web site.

M: I think it's, something like that [inaudible].

Ivan Pope: Excellent. A little inside information, it sounds like. Excellent. Okay, I'm going to wrap that up now, and let you get away. And thanks a lot for staying, and thank you very much to the panel.

I just want to say one more thing, to invite you again to come to London and see what's going on here. We do have Internet Worlds of our own in London. We have one very shortly in the Fall, and we have one in Spring, which is our big Internet World in London. Steve is actually the conference chair of the Internet World in London, and it's going to be an excellent conference next Spring. So if you want to come along, Internet World from Meckler, this Fall or next Spring, come and see what we're doing. Bring your stuff over, come and join in. Thanks a lot. Thanks to the panel.

INTERNET TRANSACTIONS TRANSACTION OPTIONS



MODERATOR

David Fox
Founder and CEO, KnowledgeWeb, Inc.

SPEAKERS

Cliff Utstein
Director, Commerce Products, Open Market
Michael Slade
Vice President and General Manager, Corporate Services, CheckFree Corporation
Pierre-R. Wolff
Director of Marketing, First Virtual Holdings, Inc.
Robert Hettinga
The Shipwright Development Corporation

[Host]: Ladies and Gentlemen, after Halloween night I don't want to say good morning too loudly, just in case any of you've heard enough screeches already. Of course, others of you were very good, I'm sure, and didn't go out at all, but just ate all the candy inside in the room. Of course, I didn't do either one of those bad things.

It's a pleasure for me to have the opportunity to welcome you here this morning and introduce David Fox. I won't belabor the obvious. Doing commerce on the Internet requires transactions — that's why you're here, I suspect. I will belabor the obvious in one small way, for those of you who are sitting further back in the room than the pillars are situated, I'd suggest that you have a disadvantage that will be eliminated should you choose to move to the front of the room. And indeed, there are plenty of chairs in front. But having had the opportunity to do research in the area of how people choose to sit in a congregation, if you can call it that, the more skeptical they are, the further they sit to the back; in case there's an effect of being close [that] makes you believe it or not. So, for those of you who don't believe anything about any of this, probably sitting in the back has its' advantages.

Anyway, David Fox is here with us to moderate this session. And to introduce the panelists and such. Let me say David started business in 1975 as part of a family retail operation, I gather, and in 1985 began to work and, not surprisingly successfully, because he was working with all the Adobe and Radius [people]. And then, in 1992, apparently, had the good sense to get wind of the opportunities in the Internet arena. I must say that I, myself, got wind of the Internet in 1992 and since I was an old lapsed, or have now become, at least, a lapsed academic, decided that there were plenty of opportunities to help all of us in society, educationally and otherwise, and certainly commercially, by taking advantage of the Internet.

Ladies and gentlemen, it is my pleasure to introduce David to you this morning and also to encourage you to think very carefully about what you hear today. Think about it in terms of what's real about it and what you have questions [about], because you should ask. Think about it in terms of what's important. And how does it work for you, and such. And most of all, I suggest that you think about it in terms, at least partly, about how it will make a difference for you. So, Ladies and Gentlemen, David Fox and panelists.

David Fox: Well, good morning and welcome and thank you for being here today. It's an interesting comment about being skeptical in the back of the audience. As I was walking around, sitting right at the back are people from AMEX. So, if you haven't done a lot in the Internet transaction world yet, perhaps that's true.

As I was introduced there, my original background in doing transactions was in a retail business. It was 1985 when I set up a distribution company. We represented companies such as Adobe and Radius, so I have two 'lots of experience': one in retail and one in distribution. I'm now integrating that into the Internet. So, for the next couple of hours, I and my fellow speakers, we have Michael Slade from CheckFree, Cliff Utstein from Open Market and Pierre Wolf from First Virtual as well as a wild card in here, Robert Hettinga from Boston.

I plan to introduce some ideas and make some comments and then, the speakers, those speakers, will go into more detail. Now, this isn't an easy subject to cover in just a couple of hours and of course there are more presentations today. I don't think you would expect it to be easy to cover, because the Internet will play a critical role in an extraordinary reshaping of business. The one thing I can say for sure is that this is an exciting place to be.

I first came to Boston in 1985 for the MacWorld Expo and this show certainly has the sense of excitement and urgency and doing some new and exciting things that that early show in 1985 had. I think, though, it will be a lot more successful than the Macintosh was on its' own.

The first question that I'll examine is why there are so many options for transacting business on the Internet and I'll take a brief look at standards and security and make some comments about where you might want to develop and house your site. [We will] take a look at when the actual transaction process will take place and who, within your organization, will run this — and this is really one critical question that you're going to need to answer. From there, our speakers will take you through some of the details.

Let's say at the outset, though, that there are many issues here and that there isn't a single solution for all kinds of transactions. It may seem obvious, but, depending on what you want to buy, you use different transaction systems. Buying a newspaper from a vending machine is quite different from subscribing to a magazine, or buying something out of a catalog from a merchant, that you may never have any face-to-face relationship with. Joining a professional association probably involves writing a business check rather than using a credit card. If you want to order a bottle of wine from France, you're looking at the different currencies that you may need to use. Licensing and downloading a software utilities involves other issues of immediacy. And, of course, buying a car is quite different again. Most people don't buy cars with cash, nor with credit cards.

It's interesting to look at some different payment mechanisms that we use today and I might ask for you to raise your hands if over the past week you've used cash, spent cash — all the hands up — that's not surprising. How about credit cards and debit cards? Most of the hands still there. How about checks? Less hands. How about a bank check? One hand up in the front here. Wire transfer? A couple of people have done a wire transfer. How about using a traveler's check? A couple of people use travelers' checks. Money orders? How about, who's done a secure Internet transaction in the past week? We have one, two, two? Three? Okay. How about used electronic cash in some form? *Digicash*. Okay, one at the center of the back there.

I think from that you can get the sense [that]: one, there are a whole host of different transaction methodologies. Second, that we are still in the very early days of doing transactions with the Internet. Now, these different systems of money are there for a good reason. Again, different kinds of transactions will require different kinds of payment. Paying for something from a vending machine, you expect to use a coin. Paying for time on-line, you're going to need some other kind of methodology of payment. Procurement cards, currency, frequent flyer miles, these are all kinds of issues that you'll have to think about, when you're setting up a transaction system. And, sadly, one of the things I said at the opening is that there isn't going to be one system that will do all of this for you.

One of the things you're going to need to consider, here, is the kind of business relationships that you have with your customers. If you have a spontaneous relationship, then you're not going to be expecting people to fill out some great amount of forms and go through some great process to deal with you. If you're going up to a vending machine to get a newspaper, you expect to just put the coin in and take the newspaper out and that's it. By contrast, if you're subscribing to a magazine, there's an expectation of filling out a form and answering some questions about who you are and what you're interested in.

So, again, as you set up your sites don't expect everyone to want to fill in a whole lot of details. Some people want to come there, grab some quick information and go. And, perhaps, do that anonymously, depending on just the kind of information that you're selling. Hard goods and services and digital information, again, will require different kinds of payment.

When people procure digital information I think they're going to expect, like that vending machine, I think they're going to want to put money in the slot and get the information. They're not going to want to go through a whole credit card process, forms, and a whole lot of rigmarole just to grab a page of information.

I think for many of us who are starting up a new business, we're actually at an advantage because we don't need to integrate legacy systems. This is one of the things that surprises me often — as I've done these talks and speak with people, especially people coming out of a marketing or sales part of a company — is that there is this side of the company, the legacy systems, the accounting systems, inventory systems, that need to plug into these transaction systems.

When someone orders something on-line, they expect to know that that thing — whether they're actually going to get it. And if, two days later, they haven't gotten that product, you have a very angry customer. The expectations for the on-line consumer are extremely high in the area of service. If you're starting from scratch, then you can build a whole new system that can be very tightly integrated with the Internet.

One of the issues about integrating old systems is that, and anyone who's an MIS manager here, would feel for this, is that as an MIS manager, they've got to get the network... they just kind of make it work. It's held together, somehow. And you walk along and, "Hey, we want to get on the Internet, we want to put all of our products on and make this information available to everyone in the world, isn't this great?" And they're going to be sitting back there and they're going to be looking at you with their fingers crossed, going, "No, hold back, I just have this system working and you want to let all of those people out there look at our systems? No way, Jose." So, if you have existing systems that need to be integrated, you've got some issues to think about there.

Some other quick things to think about, is what cost per transaction you can afford. If you're selling twenty cent pieces of information and there's a twenty-nine cent transaction charge each time that you do it, you've lost money. So, aggregation of payments is going to be extremely important.

Another part of this is going to be what you're prepared to risk and how much you're willing to put out there at risk for people — and that's obviously a lot easier in the information selling area than hard goods, where you've got to fix costs.

Again, how much hassle are you and your customers prepared to deal with. That early point I made about putting the coin in the slot for the newspaper and people don't expect to fill in a form every time they go to get a simple piece of information.

And lastly, I think, in this area, taking away the constraints, is actually doing some education on your customers and giving them incentives to actually deal with you on-line. And this is something I've found — as I've experimented with new forms of distribution using encrypted CD-ROM's — is that you really need to give people an incentive: give them a

product they really can't buy in any other form, to start moving them into this on-line world. If you just sit back and wait for them to come it will probably take awhile.

I'm going to touch briefly on standards and security, but again, just from an overview point rather than giving you any real detail. Amir Herzberg, from IBM, is here after lunch and they have an excellent security system. And there are many around the show, and many other sessions here.

I think [these are] a couple of important points. One is that there are already a lot of standards. Who knows what all these acronyms mean? Three, four, five, six, yeah. Well, that's pretty much what it's like out there. I think for a lot of you there's probably not a lot of reasons to know about them. I think that there are other people who will do the learning on these systems who will be able to set up the transaction processing systems that take care of these different standards. If you want to have a little bit of [a] late night, get to sleep reading, take a look at any of these documents. The specifications and implementations for any of these. It's interesting reading.

Beyond those standards there are other systems, such as Cybercash, CheckFree, Digicash, and [then] there are the standard bodies that are trying to work to bring these together.

The thing I'd like to say about standards, is that they are critical to making this whole Internet transaction business happen. Because if I have to go, if I want to go to "Molex" and I've got to use some special browser for it, and some special password, then, there's going to be about three or four places that I'm going to shop at and that's about it. Because I'm going to forget how many passwords — how many people here have trouble with their passwords already? Yes. Now, we've got some hands raised, great. This is a real issue that the service providers need to get together on, because we've got this great dangling chain of keys that we're carrying around with us, except it's in our heads, and we tend to forget what these key numbers are. This is a really critical issue.

Essentially, standards precede widespread adoption. That's just a simple fact. If I can't take this automatic teller machine card and use it in a range of machines, or take this credit card into a range of merchants, it's not going to get widespread acceptance.

And whatever standards come along, need to address multiple groups. They need to address what consumers want to use, what businesses are prepared to deal with, and also regulations. And this is one area, the regulations area, that I think is lacking, [and] has fallen behind the pace of change. That's probably stating the obvious. A lot of this work can't take place without a context of rules and regulations that cover it.

It's an interesting question about what standard will win. And I certainly won't stand here and predict what that will be. I think we've seen this happen time and time again in the consumer electronics world where, we had eight tracks, moved to cassette, and then there's this other thing called DAT. Well, is DAT better than cassette? Yes, it is, but has it had widespread acceptance? No. It has got acceptance in a specialized market area and that is the professional recording area. So, one standard that may do well like cassettes in the consumer marketplace, may find a different standard taking hold in the business marketplace. And again, my point where there's no one solution that's going to cover this whole gamut of Internet transactions.

You see the same thing happen with the beta and VHS wars, where VHS won out. And yet, there's this other standard that came up, called Video8, because it offered something that gave you a long tape, for low cost, in a very portable environment and helped make small cameras. Laserdiscs, I think, are giving way to CD-ROMs, and [then] you have other standards, like DCC and mini-disc, that don't seem to have gotten anywhere. They've gone past the consumer's interest and they don't offer enough beyond standard audio CDs.

So, standards are something that you're going to have to watch very closely, they're something that you need to abide by, because if you're off making 8-track tapes, then you're going to find a pretty small market.

Security is another area I'll touch on briefly. I'll be asking you to raise your hands again, but how many people here use PGP or one of the other security products? A few paranoid people here, but justifiably. Now, the thing is you have twenty hands or so out of 150 or so people. Anything that involves high levels of security, cryptography, and so on, don't expect these to become standards overnight. Here we are a fairly leading edge group of people here, and four out of five of us aren't using any kind of cryptography security at the moment. Then, don't expect the audience at large to go through much hassle in doing that either.

Whatever you do in the security area is going to involve trade-offs. It's going to involve trade-offs between ease of use, on the one hand, and effectiveness, on the other. The ultimate way for security, have keys that change every day, hardware-based security at both ends — these things are impractical for most people to employ. One thing I would say to watch for is the rise in smart cards, the stored value cards. I think we'll see those playing a critical role. And if we have a whole lot of software break-ins, then I think this business won't take off until you have something like a stored value card where you've got this piece of hardware that is a much higher guarantee of security.

The essence here is the tougher you make it on criminals, and vandals, the tougher it's going to be for you and your customers. The more encryption you use, the more computing power you'll need to decrypt the stuff and the more computing power that's needed to decrypt at the consumer end as well. There is a real benefit, though, when we actually make the standards and make the security work on the Internet.

For those not familiar, this concept of card-not-present sale is an important one. In mail-ordering, and people who do business through the Net are classed under mail order, there is an added [cost], an extra percentage that you pay because you don't actually have the consumer's credit card in your hand. And that might be, [say], .2 % or .5%. It's something extra that you, and in turn, the consumer are paying, for that card not actually being present. I think when we get an end-to-end security worked out here, you'll be able to achieve a better discount rate, [because].2% on a hundred million dollars in transactions — we're talking some real money there.

A couple of points about where to develop your site. A few years ago, there were really only two options. They were to do it all yourself, or to go with a commercial on-line service, and we're finding some in-between points now, companies like Open Market, First Virtual, with their info house, offering in-between points that give some of the control and flexibility that you'd have as a do-it-yourselfer, without some of the risks. Let's take a look at that.

Control, flexibility, time and market is what you may gain by doing this work by yourself. And, of course, because you're not paying out to anyone else, you'll have lower costs, if your volumes are high enough. If you're going to do a couple hundred thousand dollars in transactions, the hundred thousand dollars you spent in setting up the system may be a complete waste of money. You may be better off paying 20% to Microsoft Network than trying to set up your own system. I think there's a fair downside to trying to start from scratch and do all this work yourself. That control, flexibility, time and market can actually flip over on you. And I've seen this time and time again out there, where the control actually gets out of control, you have inflexible systems that take months to get to market.

There are plenty of up front costs in building a system. You could easily spend \$70,000 or \$80,000 to run your own system. Between the cost of a server, a line, and in fact, multiple lines, because it may be fine if you're running a bit of, doing some marketing on-line, that your systems isn't available here and there. But if you're doing transactions on-line and people are

coming there to do a transaction and it drops them out halfway, you're going to have a lot of customer service issues to start dealing with, and that's seven by 24. Seven days a week, 24-hour availability is going to be critical in making these Internet-based transactions work.

You know what it's like on the Net. Whose Internet connection works all the time? Right. How often does an ATM not work? Not very often. If you walk up there and every third time you used the ATM, the thing didn't work, well, you'd probably soon give up on the thing. You know, we are dealing with computers here, and reliability isn't one of the great things about computers.

If you're doing this yourself, you also need to understand the complexity, the security and the technical requirements. If you're a propeller head, that may be of great interest, although I might recommend to you that you might be better off billing your time out to someone, [rather] than trying to build your own system. The key thing here, I think, is that there is a real move away from core competencies if you try to take on too much of the work.

Internet service providers may offer an alternative. You certainly have got some expertise there, the focus though — and you really need to look at this if you want to partner with an Internet service provider — is on pipes and switches, rather than on whole end-to-end transaction processes [that] the guy in the Open Market goes through. As we go through the Open Market presentation, if you're not familiar with this end-to-end transaction, I think you'll understand what I mean there, after his presentation. And again, is this really their business to be in.

And on [the] Internet, some kind of aggregation service may be another way to go. There's certainly going to be less up-front cost, much faster time in market, [because] you're using the experience of people who've been there and they've done it before, and there's the potential that they can provide some early traffic to you. On the other hand, you do lose some flexibility, you are sharing information out there, and who knows, you might have a competitor sitting right next door to you. You may have some branding issues.

I think the other issue here is, of course, finding the right partner. And isn't this what business is all about? What makes the difference between good business and bad business, are the people that you're working with. And it's really hard to work out today who's going to be a good mole partner and who isn't. Who knows, you might end up with one of those landlords, like in real estate, that just want to gouge you. It's probably easy to pick up and move shop though, that's the one asset you've got. And of course, you'll have a revenue sharing... some kind of revenue sharing split with them and you just need to do the numbers on that. If you're going to do a couple hundred thousand dollars worth of business, right now, I'd say to most people: unless you're really interested in the technology, just forget about trying to set this up by yourself. Working with a [mole] or some kind of aggregator is going to be a much better way to go.

One of your few options awhile ago was a commercial on-line service. One of the things they bring is a big base of customers and they already have your credit card number. So, if there's something about transferring credit card numbers around, it doesn't matter because they've done it, they've done it through a secure link — the link when you first registered. And they've got your card there and they make the transaction business really easy.

Again, you've got a big revenue sharing thing, [although] it's starting to get squeezed down, but, we're putting our service up on Microsoft Network and they want 20% or 30% of the take. Which is better than the 80% that CompuServe, AOL, and Prodigy used to take. So, 20 versus 80? They certainly lack flexibility, though you're going to have to fit in with their structure — just try and do something interesting on Microsoft Network now. Good luck. Maybe next year.

Differentiation might be difficult, maybe less so with the new systems, but with the old systems, you had their box to fit in and [to] try to differentiate and get your brand across is very difficult. And this earlier point I made about your transaction system: if you're shipping hard goods, that may be a real bear to try and hook your transaction system up with theirs. So, take a good look at these things.

An interesting point, did someone mention the government here? They were certainly talking to someone from the military up here before. These issues of sales tax, contract law, rules and regulations — these don't go away in cyberspace, these exist. There is a body of work that a colleague of mine, Benjamin Rider has done called, *The Law of Electronic Commerce*. Don't drop it on your foot, it might hurt. There's a handout on this at the back, if you're interested, or have people in your organization who might be interested.

A lot of the rules and regulations that you need to understand have been developed for EDI and — Electronic Document Interchange — it could be a place to look. And, of course, this global market is fantastic, but there will be some global issues for some of you. Not for all of you, but there will be some global selling issues about whether you can sell into certain markets, and what you can say and what kind of visuals you can use — you don't want to end up going for a holiday in Iran one day and being arrested for the skimpily clad woman you had displaying your merchandise. More bizarre things could happen out there. And they probably know who you are and may be tracking you.

The other part here, I'll just touch on, having been a distributor in another country, and worked with the issues of where we made out money, was on the up-lift: how much over the U.S. price we could sell at. In fact, a lot of the publishers we dealt with always wanted to have a higher price they charged international distributors. Well, what's going to happen to your customers out there, to your distributors, and your resellers out there, when your customers in other parts of the world can see the prices that you're selling for in America, and see the services that you're offering here. It's not a government thing, but it's something that you need to think about in the global market.

There are three basic times that the transaction can take place. It can take place off-line, which is really the brochure phase that most of the Internet is in at the moment: this is where you offer the product for sale, people may fill in a form on-line, but more likely they're calling in to an 800 number.

Most of the on-line work that's getting done today is batch-oriented: the information comes in somewhere and, in most systems that I've looked at, it actually gets re-keyed somewhere else into an order processing system. The kind of system we really want to get to, though, is an on-line, real-time system for most users, where the Internet is transparently hooked into your in-house system. There may be a mediator there between you and the banks, for clearing a credit card — Michael Slade will talk more about some of these issues. But, there are three distinct ways to go with an off-line transaction when someone is calling in. Obviously [it is] not a full Internet transaction. It's really just a brochure on-line. You really need to be careful, in this batch-oriented world, especially if the people that are batching it may be slower than your ability to get out there to customers. People on-line, again, have real expectations for real-time information and real-time delivery of products.

One of my closing points here is, who should look after this from within your company, and I'm seeing all sorts of different people taking charge. I think that essentially the direction needs to come down from the CEO, the executive in the company. The only problem is, and with apologies to some of you here in the audience who are bringing yourself up to speed, is that most of these people are clueless when it comes to technology. And there really is a gap between what they really need to know and — any of you who are having that experience already of trying to explain to a CEO or your executive what the Internet is about and what

doing an Internet transaction is about when they've never even seen the Net, you know, it's a lot of hand-waving. You really need to encourage these people to get on-line and start using it.

Most people are creating some kind of new group within the company. But then again, this group, if there isn't a really close connection to that executive, you're going to have some real problems, because it involves sales, it involves marketing, it involves the distribution. You can make a great site and do great transactions, but then if order processing takes three days to get this thing out the door, what you're dealing with is an awful lot of unhappy customers.

I've set up a set of pointers — you may like to take a look at these. [They are at] www.payweb.com/d-commerce. These are pointers to about 150 sites where you can get a lot more information. I've done this rather than giving a printed handout today, because this information changes so quickly. One of the other sources is... there finally are a couple of books coming out. In fact, I've got two copies here of a book called *Digital Cash*. So, when we go to the panel session about midday, I'll get a couple of people to come around and collect some business cards from you and we'll do a draw for these two copies of *Digital Cash*. It's a new book by Peter Weiner, it's on AP Professional Press and it actually comes with some First Virtual software included.

There is another new book, I was just at an electronic commerce conference in Austin, there's a new book coming out called *Frontiers of Electronic Commerce*. This is another one you wouldn't want to drop on your toe, it's 848 pages, it is written by two gentlemen named Rudy Calcutta and Andrew Winston, the book is \$45.25 and it's not available on-line. How amazing. And surprising. But it is on Addison-Wesley. There's bound to be a whole stream of others. I think there's one that's been done recently by one of the people involved with CyberCash. And this reading really will be essential if you want to get a broad overview.

And with that, I'd like to turn to our four speakers. Our first speaker is Cliff Utstein, from Open Market. I saw his presentation yesterday on the Open Market system and I think this is a great system. I think they're on a real winner here. They've brought together... they've taken it from two levels: they've brought together a lot of the separate components that you used to have to string together yourself and, on the other hand, they've given you a lot of the benefits of a commercial on-line service. The back end transaction processing — they've broken that away from the front end. You've got total control over how your site looks, and they control the back end. I really think they've got an interesting site.

Following is Michael Slade from CheckFree. We'll talk about their system, they made some announcements yesterday. And then we'll have Pierre Wolff from First Virtual, whose system has been operating successfully for one year on the Internet, which few people can say — I don't think anyone else can say, and he's got some interesting things to say as well. At the conclusion of their formal presentations, I'll introduce Robert Hettinga, who's a local in Boston, as I said, the wild card in this bunch. And we'll have half an hour or so for a panel discussion and more questions.

If you've got a couple of questions for the presenters in-between as they change equipment, we'll take one or two questions, but I'd like to keep this kind of moving forward and then open this up for a panel discussion at the end. So, unless there's a burning question for me, that someone really has to ask now, I'll hand it on to Cliff and go through the other speakers, and we'll all get back together at the end of this. Take it away.

Cliff Utstein: Thanks David. As David said, I'm Cliff Utstein from Open Market and I'm going to spend about twenty minutes this morning talking about Open Market's commerce architecture. If you would like a copy of the presentation, the best way to get it quickly is drop me an e-mail — and I've got my e-mail out there, utstein@openmarket.com. I can either snail mail it or e-mail it to you in *Power Point* or *PostScript*, just let me know what you'd like.

I'm going to focus this morning on our commerce solution, as I said. And our commerce solution is a set of software products. What I'd like to do, actually, is start by telling you just a little about Open Market, and just spend a moment or two. Open Market has been around since April of 1994, which makes us one of the oldest Internet-focused companies. We're based right here in Cambridge, Massachusetts, and we're up to about 165 employees, but that number seems to be changing more rapidly than my presentation can be updated. We've got about five to ten people a week coming on right now. We just rented four floors in the old Carter, Inc. building right on Memorial Drive and we're growing very rapidly.

We are privately financed. As you see there, major publishers are the primary financial backing of Open Market and also, as you're probably aware, much of the backing of the Internet today. Time-Warner's *Pathfinder* site is a great example of some of the work that we've done, Advance Publication's Conde Nast with their Traveler's site, the Conde Nast Traveler's site in the Chicago Tribune.

By way of background, I would like to just put up there, some of our customers, and some of our partners. Some of the ones to point out there from a commerce perspective, Bank One, is one of the top ten banks, we've done an EDI solution for Bank One. Where libraries today can buy publications and periodicals on-line right from the manufacturers and publishers of these. It's a solution that, when taken to EDI on the Internet, cut 80% of the cost out of the purchasing and the distribution cost here. It's truly revolutionary, the message that Bank One is getting from their customers, that this is not cutting 5% out of the distribution and ordering costs here, this is 80%, [this is] big news.

First Union's another partner of ours. First Union is looking to bring up 35,000 merchants in the next year in their community environment. Anyone from the North Carolina area that wanted to go to a Durham Bull baseball game this past year could have actually bought their tickets on-line, using Open Market's commerce architecture. Those are some of the highly visible ones.

We have relationships with American Express, with "Lydol," with CheckFree, as well. We also made an announcement, just this week, with IBM. IBM's going to be running some of our back-office software and that will be clear. What that means is that I go through our architecture, with a front-office, back-office scheme. FTP's another partner of ours that we recently announced, CyberCash, as well.

So, just to list a few and to give you a flavor of where Open Market fits in here. In our work with these partners, in developing solutions, we've actually been through several iterations since April 1994, as to what Open Market, as a company, is going to do. And, unfortunately, that comes back to haunt us every once in awhile. People say, "What does Open Market do?" And let me take you through some of that.

We started out consulting for *Time* and some of the other publishers and developing solutions for them. We then transitioned into a service area, we thought we were going to be the biggest marketplace and the biggest mall on the Web and we've since moved to an environment where we are a software company. And we are developing software for businesses, for malls, for service providers, for their solutions for electronic commerce and enterprise solutions on the Web.

Through all of this experience that we've gained, thinking we were going to do it ourselves, working with our partners on a consulting basis, we've been through a lot of the obstacles that everyone's facing now, doing it for themselves for the first time. And what we're proposing here are these seven requirements for highly effective Internet commerce.

Let me take you through each of them briefly. These are what we believe the highest level... most important areas that you should be thinking about when you think about running your business on the Web. Number one, I'll bet everybody's thought about security. How many

people have thought about security? This is the big one, how am I going to do it. How many people are concerned about sending their credit card information over the Web? Whether they're using STT or SEPP or anything? Okay? About a third? Security is a big issue and having security commensurate with the information that you're trying to protect is very important. One note here, is that it does take a different amount of security to protect a credit card where the liability for the consumer is \$50. Obviously, the liability for Visa or Mastercard is a lot more if they were to get out in the masses. However, from a credit card standpoint, a credit card is really not a secure number, every waitress in this town got 15 of them last night, so they're not that secure. There are things, obviously, that are much more secure than a credit card, like, if you're a bank, the ability to move funds around as a customer, so security commensurate with what you're protecting is really the message here.

Number two, the ability to focus on generating compelling content. Using the right HTML authoring tools, setting up the relationships with third parties, being able [to utilize] HTML links on the Web, being able to customize the site on a personalized basis. Knowing that if a customer comes in and buys a black sweater and then black shoes and black socks, the next person who comes in to buy a black sweater... you'll probably want to show them the black shoes and black socks somewhere on that page, because you've learned something about buying habits of your customers when they've bought something. Setting it up so that, if you've got a customer in one that subscribes to your service, you're going to show them something different than one who hasn't, maybe they get special offers, special pricing, etc.

Number three is the area that most people focus on when they think about electronic commerce, and that is the on-line order taking and payment processing. Obviously a very important component here, and we've got some experts who will speak about this after myself. The ability to fulfill soft and hard goods — soft goods, of course, in light of this new medium. The ability to, at three in the morning, go in and buy a report and have it on your desk instantly, is the compelling area here. The ability, as a software company, to be able to sell your software and have that downloaded instantly by the customer. From a hard goods perspective as well, as David was saying, to link up your distribution mechanism — to give customers the option that, if they want Federal Express, that they'll have it the next day. And taking care of the hard goods delivery there.

Customer service is another real big area that people setting up their business tend to sweep under the rug when they start. And this is essentially a very expensive area because, when your customer runs into a problem on the Internet, as David was saying, the Internet is not always there, the phone line goes down in the middle of their downloading of the information they just bought, they're not sure whether their transaction has actually gone through, what do they do? A natural thing to do is to go and pick up the phone, because they want to talk to somebody. What we're suggesting is [to] provide them with a solution on-line — where they don't have to do that, where they can go and check on the records, on the logs of everything they've done and be able to reacquire goods that they were in the process of acquiring, or even reacquire goods if their hard disk were to crash and they were to lose their goods, through no fault of any system.

Every phone call — Visa and Mastercard estimate — to them for some type of dispute or question runs between \$50 and \$75 apiece. And, typically, what they're doing and what the business is doing, is actually acting as a human modem, downloading the information via telephone that the customer could be downloading [from the] system, etc. With that, by way of background, as areas to think about, what I'd like to do is transition into our architecture and what our products are based on essentially.

This is the Open Market commerce architecture, where we separated into three phases, here. You've got the buyer using their browser, any browser out on the Web, and as you

know, there are many, many browsers. In fact, coming into the *Pathfinder* site we're actually doing some checking right now, because we're doing the authentication for the *Pathfinder* site, and on a daily basis, there are approximately 180 browsers that come into the *Pathfinder* site. And those are different releases from 1.0 to 1.1 to 1.2, etc. And, of course, all of the different on-line services have their own browsers and all the different browser manufacturers and the browsers that are being built into applications. So, being browser independent is really a key message here, and that's just the same as saying in the concrete world that you'll accept anyone who walks into your store.

From the front office perspective, as we move there, this is what we're calling your business, your traditional business, this is what you're doing today, converting your business, your front office into the Web. And, if you're selling information, it's a dynamic representation of that information for the Web. If you're selling hard goods, it's compelling representations of those hard goods, maybe with contests or other things. This is what you do best in your front office. This is the merchant and the business.

The back-office, in this scheme, is actually a service provider. This back-office is, if I were going to draw the example to the concrete world, if you set up your business today and you're 15 people, the last thing you want to worry about, when you're worried about your line of business, is payroll, or accounting or your legal services. These are all functions that you want to off-load, and what we're proposing is that you can off-load all of these functions. And I'll go through, from a Web perspective, what that means to a service provider, a third party, and let you focus on your HTML content, your Web server, your site, your front office concerns.

This architecture actually is very close to — how many people have ever shopped at Toys 'R' Us? Okay, good. So, this example is going to work for most of us. You go into Toys 'R' Us and you find what you want, or you work with a salesperson within Toys 'R' Us, and you find this product that you want to buy and there's this ticket on the side of the product and you take it off the rack. And that ticket uniquely describes the item that you're buying. Everything from the manufacturer, to the price, to... if the offer is a special that week, they've got tickets just for that week, uniquely describing that product. Then, you take that ticket and that's the front office, that's the shopping area, over to the cashier and that cashier authenticates you, takes your form of payment, asks you if you want to pay by cash or check or credit card and that's the back-office, now.

You've actually made a transition, in this model, from your ticket, to going for payment, and adding in the sales tax and the shipping charge, if there is one, probably not at Toys 'R' Us, but all of the back-office processing, and what you end up with, there, is a receipt. And you take that receipt back, in this example to a front office, but, you take that receipt to the shipping department and they look at that receipt and they, in fact, authenticate that that receipt is valid and give you the item.

Same model here. You go into the front office to buy a report, some software, or a hard good, and you find the product that you want in that store that you've generated and there's a digital offer there. And that digital offer is actually a redirect to a back-office. And it can be any number of back-offices. IBM has announced that they're running one, Open Market's running one and you'll see additional back-offices on the Web this year. You go to that back-office, now as a consumer, and you buy the item. And the sales tax is added in, and the shipping charges and everything else is added in, and you get a receipt in that back-office, and you are a redirect again — this time back to the front office to get the item.

So, that's how this model works. You focus on the front office. You focus on your business, you don't worry about what happens after they leave your site, except that they're going to come back with the item already paid for and their receipt. So, how do you set this up is usually the next question. It's actually quite simple. You create your HTML for your front

office using any HTML authoring tool, we actually have one called *Store Builder*. [It is] not required that you use that. You can take your existing content and in there, you've got your HTML. You put it on your server, any Web server, it doesn't matter, we do have Web servers, we'll talk about them. Any Web server, and then you commerce enable it. And the commerce enabling is this act of building in the digital offers into your front office and being able to accept digital receipts. And then you're up and running in business on the Web.

From a standpoint of an overview here, you focus on the front office, you let the transaction service provider focus on the back-office and you can go in and commerce enable your site. How many people already have their sites up and running? Okay. About half. If you've got your sites up and running, you're going to commerce enable it, if you don't have your sites up and running, you can start from scratch and start with the idea in mind of commerce enabling your site, as well.

You get to incorporate back-office features as they come on-line without any additional work. The same way that a front office in the Toys 'R' Us model [works], the playpen doesn't care whether you're buying it with cash, buying it with a Visa, buying it with First Virtual or CheckFree's wallet. It doesn't make any difference, you incorporate those things transparently into your store. So, as Visa's STT or Mastercard's SEPP or one of the other payment protocols come on-line, they are all developed on the back-office software and you, as a business, don't worry about any of those things. You can accept all the payment mechanisms that are available on the Web, from the back-office perspective.

It utilizes widely deployed standards, in fact, you can go in today, into Lexis/Nexis and try this out right now: buy reports from Lexis/Nexis one at a time, pay per report, where you're going to go from the Lexis/Nexis site back to the back-office to pay for it, get your digital receipt, go back to the Lexis/Nexis front office site and have it downloaded. It's open and it's standard spaced. We use any Web server, any authoring tools, any browser, we're going to be publishing the specifications to the digital offers and digital receipts this month.

The first product availability will also be [out] this month. Let me take you through some of the components here. We've got a product coming out this month called *Merchant's Solution*, which the green components are actually the parts of. Where there's a Web server — we talked about that in the front office — we're providing the Open Market Secure Web Server which supports SHL and SHTTP, and I can get you all the information you want on that off-line.

We're providing an HTML authoring tool called *Store Builder*, which allows you to very quickly, in a Windows environment, set up a commerce enabled site — complete with departments and products and all the links that you want. As I mentioned before, you'll want to commerce enable that — and that's what Transaction Link does. And that's really at the core of this architecture, from the front office or the business standpoint. Running this transaction link piece, and that runs the CGI script on any Web server. And then from a reporting standpoint, you want to know what in your store is working — why isn't anyone buying those purple socks? Are they on a page that nobody's accessing or are they getting there and \$22 is just too much for purple socks? So, you want to figure those things out. And Web Reporter goes in and orders the log files from any server and provides you with reports customized and based on your requirements.

Finally, from the back-office perspective: linking into the transaction service provider. Let me show you what you get when you do that. First, customer service. This is one of the areas that most people aren't thinking about, and again, we provide a log file so you can go in [and] see everything that you've done — all of your history is on-line, and all of your digital receipts are on-line, as well. Those digital receipts, remember, are pointers to the information that you were buying. So, you've lost a report or, like me, you were shopping in the middle of

the night and your Visa bill comes 45 days later and you can't remember that you were doing that. You go into your Smart Statement, and you click on your digital receipt and there it is again, the report that you were buying, the one that you can't remember. [So you don't have to make any phone calls — customer service is] all automated on-line.

Of course, the order taking and credit card authorization and settlement's all on-line. The sales tax piece is a very big piece. As I talk to people that, up until now, really haven't had a solution like this in businesses, where they've spent 50, 75, a 100, to a \$150,000 on the development of their commerce enabled site. They talk about things like, how they're handling sales tax and multiple geographies and writing the CGI scripts to do that.

None of that is a concern in this model because that is all handled in the back-office. You go in when you register and specify what locales you have to charge sales tax in, and it's automatically calculated for you. And that's a product that we're getting from a third party, that's going to be updated regularly because, as you know, the sales tax code seems to be changing every few weeks.

The back-office is where the digital receipt is generated, where the shipping fees are computed. And as a business you go in and register how you want to handle shipping, how many options you want to provide people. And the customer specifies whether they want to use FedEx, the post office, or whatever, and the charge is automatically calculated in their purchase order.

The next point, based on the number of hands that went up, I think is going to hit home. We provide account-based purchases with no Internet transmission of credit card. So, you come in one time, you set up your account (and you can do that with your secure browser on-line). You can do that by telephone or by fax: you set up your account once, you've registered with the back-office, and now any merchant, in any store that's tied into that back-office... you'll be able to buy from without resending your credit card over the Web.

We do support walk-in purchases, if you don't want to set up an account, so you can walk in using your credit card or using another payment mechanism like a First Virtual or a CheckFree wallet, or whatever, right on line, and we also support customer shopping carts. So, when you go to the back-office, the first question you're asked is: "Do you want to buy it now, or do you want to add it to your shopping cart?" And then you proceed from there.

I think that gives you a good summary of the architecture and we're actually going to be doing demos in the booth, as to how to buy things. And we're going to be selling pens on-line for anyone who wants to come by and buy a pen using our credit card and have it shipped to them and see what it's all about.

Let me leave you with an example of how this architecture works from an Internet standpoint. [You can have] multiple merchants on the Internet, all linking into the same transaction service, for payment authorization, processing, sales tax, shipping charges, Smart Statements, etc. And, as the businesses grows, you see there, multiple size merchants all linking in over the Internet. From a small business on the left, growing into a large business, with multiple content sites, in varied geographies, to a very large business that actually decides, hey, "I don't want to go off-line for my service, I want to take that in-house and run that myself, as well," that's Okay too, because the architecture truly scales here.

On the thought of doing it yourself, from a contrast standpoint, when you do it yourself, what you're getting is one instance on one server for this and your business grows. You can go and buy a bigger server, and run it on a bigger server, but now you need to set up more servers, and how are you going to do it? Are you going to set it all up again, replicate the system? It becomes very complex and very costly to do that. In this model you're just focusing on your content, so that's not a concern. And, as your business grows large enough, if you want

to take in the back-office — your business is big enough to do your own payroll, great. You'll do your own payroll now in the concrete world example. Same thing here.

Let me wrap it up with a closing thought from the economists this summer, talking about the magnitude of the Internet from a historical perspective on society and on mankind. Number one being the wheel as far as the influence it's had on us. Number two being the printing press. And right up there, number three, is the Internet. This is not something to be ignored, this is not something to do a six month study on or a one year study to figure out what you want to do and let your competition beat you to the punch.

And you know it's harder, the bigger you are as a business the harder this is to do. In any revolution, the larger players are often not standing after the revolution is over, because they weren't able to change as quickly. There are new players standing at the end. And that's really the message here, from a mainstream non-technical publication, like *The Economist*.

So, to wrap it up, open-standards-based technology, integrating with solutions — like you're going to hear about next — a secure business environment allowing you to focus on the front office, [and] off-load the back-office services. *Merchant's Solution* was just announced on October 16, and it's going to be shipping this month. I can say that now that we're in November and I would encourage you, if this looks like the type of architecture that might work for your business, to come by booth number 456 and we can tell you more about it. Thanks.

Michael Slade: Good morning. As David said, my name is Michael Slade and bear with us, while we arrange the technology. Yes, a question.

M: [inaudible]

David Fox: So, the question is: "How are people going to register on-line now and have a transparent way of using this?"

Cliff Utstein: Initially, what we're doing, is: the transaction systems are tying into the Visa and Mastercard network for the transactions. So once you've got your Visa card, we actually tie right in through the transaction management system. Or if you, as a business, were to set up your own transaction management system, you would tie-in through your payment processor like CheckFree right into the Visa network.

M: [inaudible]

Cliff Utstein: Got it. The question is: "Would you, as a customer, have to register with each of the back-offices?" And the answer is initially for the rest of this year, yes — the transaction management systems are not linked. However, over the longer term, the idea is to link the transaction management systems. A question in the back?

M: [inaudible]

Cliff Utstein: The question is: "What happens if the link is down, for you as a business, to your back-office?" And the answer is that you will not be able to process. Obviously, it's the same answer if you were to set it up in a different architecture and you were to set it up locally and your link was down to processing. So, if your link is down, you're not going to be able to process either way.

M: [inaudible]

Cliff Utstein: There is the potential for more links, although there's also the potential for less links, depending on how you're processing. If you were to set up all the scripts to do all the credit card processing, and you were going to do a dial out phone line into a third party and then get into a centralized clearing, there actually could be more links that way. So, it's unclear, but you're right. I think that, as David outlined at the beginning, I think we need to make sure the Internet is there 100% of the time for this stuff to truly work.

One last question?

M: [inaudible]

Cliff Utstein: How are the screens at Open Market branded from a back-office perspective? The front office screens are branded in the front office however you like. The back-office screens are branded from the transaction service provider. Today, Open Market's running a transaction market service and they are brand new with Open Market. The idea here is that, if you are a business and a customer has come to your business from somewhere on the Web, from some random hypertext link, and doesn't know you, do they actually want to send you the credit card or, if they're on the Web and there's a trusted back-office, like IBM, are they more comfortable sending IBM the credit card? You're right, the screens, and how that transition happens, has to be very smooth, but there's a whole trust element here with the back-office being run by an IBM or, potentially, very large transaction providers.

Recurring payments?

M: Don't worry I do those.

Cliff Utstein: I'm not sure what your question is around recurring payments. From the back-office perspective, how the business is built from the back-office? Or to sell? So, you want to sell a monthly subscription utilizing the back-office. That's not something that's automated right now in this architecture in the back-office, it's something that you would automate in the front office, today. And a customer could actually go in and try to get it, on the 32nd day, and be directed to a screen that takes them back to the back-office for payment on the 32nd day.

Michael Slade: Hopefully, I'll address those two and a few others, but I encourage you to write those down, because those are the types of questions that we find people in the marketplace are trying to get answers to, because, as you have seen earlier, I'm finding a difference at this Internet World Conference than the previous two. It's obvious people are ready to do things. And these questions are indicative of months, if not a year, of hard work trying to make this happen. So, I encourage you to write those questions down and challenge, not only us, but others here, at the conference, to provide you answers, that's what we're here for.

Again, I'm Michael Slade with CheckFree, and I don't see Bill Washburn from Mecklermedia around, but I'm amazed and we should congratulate Meckler, because Sunday, Monday and Tuesday we had the best weather Boston could offer and that was the sizzle in the steak — the front end if you will. Today, we're talking about the down and dirty, back-office activities and look at the weather outside! They've arranged good weather when it should be, and now we're in here talking about the difficult things.

If you're looking for technology answers from me, I'm afraid you'll be disappointed, I'm not a technician. As my cohorts up here saw me struggle to get my presentation together, that's not what I'm here to do. I'm here to talk about electronic commerce and how to enable

merchants, retailers, etc. to expand their business and move into that 24 x 7 — take advantage of this sphere of boundless opportunity and turn it into real world hard, cold cash.

My role at CheckFree is to adopt our expertise in technology, into the standard, traditional business models. What we're finding, and I'll get into this a little bit later, is that people who intend to sell goods across the Internet [who] have already been in business, in a brick and mortar setting, cannot afford to change the way they do business, as well as deliver a new distribution system. So, what our role is in this confusing world is to help marry traditional — I like to call it the old dog... and teach it new tricks. And that's what we do.

CheckFree has been in business since 1981, we're based in Columbus, Ohio, and have been [in] the transaction process for remote transactions since our beginning.

David mentioned earlier the on-line service providers already have your credit card number. Well, what they do with it is send it to me to get it processed. If you are a CompuServe user for example, the guy standing here in front of you is the one that's processing those transactions for your monthly subscription fee.

In 1995, CheckFree will process a little over \$9 billion in remote transactions between consumers, companies and financial institutions, represent[ing] a little over 60 million transactions. We think that in any commerce model, there are three parties: the buyer, the seller and the financial institution that mediates the movement of the money between the buyer and the seller. CheckFree is a service provider, we are not a bank, although we are capable of many of the transaction processing operations of a bank, we are not regulated as a financial institution.

In the consumer world, we have three products that have been around. *Bill Delivery*, which is the last one on the screen, was just announced last week. That is the service that allows the consumer to receive their monthly bills from their billets. The pilot began last month, and it involved Southwest and Bell telephone as well as three utilities in South and Central New Jersey.

The CheckFree payment service is the leading electronic bill paying service today, allowing consumers to use PC's and touch-tone phones to pay their monthly bills. At the Internet conference, here, we are focusing our efforts on the CheckFree wallet. Which is a secure purchasing facility across an open network. In the business sector, we offer a variety of goods and services as well. This is a business unit that I am responsible for, and, again, our specialty, here, is in moving money between a buyer and a seller, whether the buyer is a consumer or another merchant.

In [the] financial services arena, we provide wholesale services, if you will, to banks and other financial service companies — which gets to the issue of branding, which I'll talk about in a minute. Branding is a very important issue right now, even more so to the consumer. We don't have a lot of time to figure out a lot of things, so we tend to trust brands we're familiar with. And I'll go into that in just a moment — right now, as a matter of fact.

In the roughly 15 years that we've been doing business, we've built a database of knowledge and information that tells us some things — we've learned some lessons the easy way and we've learned some lessons the hard way. First of all, what we have found from consumers is they understand clear value propositions. We as consumers don't understand complex messages, that's why TV commercials are becoming five seconds rather than a minute. We just don't have the time to understand complex messages.

Secondly, we desperately want convenience and control. The popularity of ATMs is a prime example of that. If you look at the adoption or diffusion curve for automated teller machines as it compares to credit cards, even though ATMs have been around since the mid-60's, once the ubiquity factor was addressed, the adoption rate by consumers skyrocketed, and we all know how quickly credit cards became accepted. ATMs became accepted at a much

greater rate, once they were convenient to use and available anywhere the consumer needed them to be.

Control is a factor we all have to have — particularly in light of how tough it is to earn and keep a dollar. We don't want to lose those precious units of our monetary measurement. The trust in brand names actually, we're finding, is probably the most important, particularly when you're talking about doing commerce in an environment where you're not face-to-face in being the counter-party to a transaction.

If you look at the brand names, that we know and love, and look at your own household, you will find several brand names, because you don't stand there and read all the fine print on the packages that the government says merchants have to put there. You try something, if it fits your need, you remember the brand and you use it again and again and again. And, I will tell you, that's becoming an increasingly important factor, particularly when you talk about consumers doing business with companies across an open network.

We all have rules as consumers, as businesses, and it is important to have a rule that says counter-parties to a transaction know what to do when something goes wrong, because something inevitably will go wrong. You get an error in your bank statement, you know what to do. You go to the bank or you call the bank, and if they don't satisfy your concern, you leave the bank.

When someone steals your cellular phone number, you know the rule. You call customer service and say: "The bandits got me" and they shut that number down and they give you a new one. The on-line services, the CompuServe's, etc., have learned to establish a clear set of rules when something goes wrong. They have adopted their business model such that, if their monthly subscription to your credit card comes back and it was returned by the issuing bank, they shut you off. They manage their risk appropriately. Consumers who are in the habit of doing that know the rules — they go get another credit card or they provide another means of payment.

So, it is important that, if you're transitioning or you're adding electronic commerce to the way in which you sell your product or service, that you communicate to your customer what to do when something goes wrong, and that will enhance customer satisfaction in their shopping experience — particularly at your store or your electronic storefront.

[In] talking to companies and individuals who intend to sell goods and services in [an] electronic open network environment, there are four key factors that we hear time and time again. I've heard these in the last 48 hours more times than I care to remember: we're hearing that you folks want to expand your distribution, but you can't afford to go out and build brick and mortar. Secondly, a number of you are pretty darned tired of paying higher rates for credit card processing and, not strangely enough, the consumer's well protected, as we heard earlier. So if something goes wrong with a credit card transaction, chances are pretty darn good that it's the merchant that's going to eat the loss. And for that privilege you get to pay a percentage of your sales — a percentage of your sales for eating the loss. That's a business model that I just don't understand.

So, what we hear is you want guaranteed payment. You want to know that, before you ship that \$50 item or that \$4,000 P.C., the transaction is not going to go bad after the goods are gone. That's particularly important when you're selling perishable soft goods in the remote open network environment — because that article, that piece of software, once it has left your server it's gone, you can't go back and get it. In fact, it's not cost-effective for you to go back and get it. You'll eat the loss. [It] reduces profitability and makes you a very unhappy businessperson. So managing the risks more effectively is something that's very critical, and if you're looking at electronic commerce, if you haven't found a way to do that, then I suggest you might want to take your time a little more carefully and rethink your standard risk models.

When it comes to marketing and sales, the promise of this new technology, this revolution, is that you'll be able to get more out of your marketing and advertising dollars by targeting those activities to pre-qualified buyers. I heard an interesting statistic last week that automobile companies have proven that they're willing to pay as much as \$300 to \$500 for a qualified lead. It's not surprising, when you're going to spend \$30,000 on a new car. That's what you need, if you're going to do business in an open network environment. You will have millions of hits, how many of those are qualified leads? So, you need to work on the distribution channel and on your marketing channels to encourage not everyone, but everyone who wants to buy the kinds of goods and services you have to offer. And that's an important factor in doing business electronically.

Finally, the question about remote transaction systems (he left the room for a moment) but we all need reliable infrastructure and technology. One of the most frustrating things for us, as consumers, is to stand in line waiting to run our credit or debit card through at the checkout counter, particularly the day after Thanksgiving and you wait, and you wait, and you wait. And it's even more frustrating when the expectations in the electronic digital environment are instantaneous gratification. So, you're right, you can never be down.

And, I'll apologize in advance [to] those of you in the technology sector or MIS functions, who think that high availability is satisfactory. No, no, no. You can never be down — that's lost sales and lost revenues. Very unhappy businessperson. What we've done with the CheckFree wallet is try to address some of those factors, and we don't profess to have all of the answers — we're in a trial phase of the new era and I would suggest to you that the \$200 million dollars, or whatever the number is, that's being spent on the Internet today, is just a drop in the bucket to what it will be next year and the following year.

What we're trying to do is stimulate and encourage trial behavior on the part of consumers and merchants. Our goal is to eliminate the risk in putting your foot in the water and trying electronic commerce. And we do that by developing partnerships and providing very attractive deals, if you will, to get you started. The CheckFree wallet — and I'll describe it in a little more detail later — is our implementation. It is both client software as well as merchant server software that is to be used either in a check free branded situation, or in a private label branded situation, that will allow consumers to purchase items safely and securely over the Internet.

There are two key value propositions, whether you look at the CheckFree wallet or [at] one of the other many payment options, because I will tell you there will be many and there will probably be more than there are today, we just haven't built them yet. We haven't conceived of them yet. But the first value proposition for the consumer has got to be to allow them to do things the way they do them today with the exception of standing in a store. They have to be able to do it when and where they want to do it. In the banking world, home banking was tried some 15 years ago: it was expensive, it was cumbersome, it was slow, banks got out of that arena.

Technology and the infrastructure has evolved, we, as consumers, expect our primary financial service providers to do business where we want to do it, when we want to do it and how we want to do it. Looking around this room I'd venture to say many of us can't remember the last time we were at a bank branch, except to borrow money and even now you don't have to go into the branch for that anymore. For the merchant, it gets right to the bottom line, how do I make more money, and that's why you folks are in business and there are a number of factors to that, but those have to be the clear value propositions in doing business electronically.

I'll run through some things in the CheckFree wallet. There's no charge to the consumer, there's no preregistration. Our experience tells us that when you go to shop in the

store, unless you have the store's proprietary credit card, you didn't preregister with the store. You walked in, you bought a shirt and you left. And, if we can't emulate that behavior in an electronic environment, the consumer will have an unsatisfactory experience. It has to be easy to use. We all know how to reach in our pocket, pull out one of those cards or some of that green stuff and lay it on the counter. We have to emulate that behavior in a digital environment.

[It must be] browser independent. We don't tell consumers which car to drive into the shopping mall, we don't tell them what bus to ride, what makes you think we'll be able to tell them that in the electronic world?

This is all I'll say about security, we have it, it works. We'll get better, there'll be more as we go along, but when was the last time you worried about what happened to your ATM card number after you stuck it in the machine? You probably didn't think about it. You probably thought more about the guy — who's my size — standing behind you looking over your shoulder, wondering whether he's going to hit you in the head.

We have to have records. We may never use them, but we keep lots and lots of records as consumers. The CheckFree wallet today is the initial implementation, and is a co-branded client application with Cybercash. CompuServe's *Mosaic in a Box*, that was released in late August, includes the wallet — it's private labeled as the *CompuServe Wallet*. Spy Glass's enhanced *Mosaic* will also include the *CheckFree Wallet*, don't know if it will be branded the *Spy Glass Wallet* or not, but it doesn't matter to us. Additional client applications, be they individual, stand alone browsers or CD-ROMs distributed by merchants, that have the entire catalog on the CD, or have the purchase capability built right in, and the *CheckFree Wallet* will be one of those.

You can download it, not only off of our Web site, but others. The point is that we're striving to make it readily available. The analogy there is the three or four credit card offers you get every week in the mail — if you're not getting wallet offers in the mail now, you soon will be. It has to be that ubiquitous. I mentioned providing a risk free trial for merchants: CheckFree's Consumer Bill Payment service has a two-way electronic mail capability built in. We've got somewhere around a quarter of a million consumers who use us to pay their bills every month. They communicate with us about three times a month on average. So, we said, "How can we put something we have, that not many other people have, which is this ability to host a message to that many consumers on a regular basis, with the merchants who have a need to have qualified potential buyers come to their site?"

First, we have to get the merchant up — we can't wait for all of the hardware and software and technology guys to bring ten thousand merchants to the Web. So, what we decided was to try a little promotion, a little merchandising, a little marketing. And beginning November 15th we are launching the CheckFree Gift Link, which is really a miniature electronic mall with a number of merchants who are putting one or two gift items on sale at no risk to the merchant.

There's no technology investment, we're driving consumers to the page, so there's not a whole lot of marketing that they have to do. And what we're doing is allowing them to begin experiencing what it's like to receive orders in this environment. It's essentially a no risk proposition. That's a short list of some of the merchants that have already announced that they will participate in the gift link. Victoria's Secret Catalog, Cheryl and Company which is known as Cheryl's Cookies, and, if you go down to booth 750 our sales guys hopefully haven't eaten all the cookies that Cheryl's sent to the show, go down and get a chocolate chip cookie on us.

The point here is that this is trial behavior. The marketing objective is to stimulate trial behavior and that's what it's got to be. We work with MC Squared, now part of an advertising agency, to allow companies like Victoria's Secret to sell one thing when they happen to be selling three different gift certificates across the Web, and to get some experience in that

regard. There's a quick shot of how easy it is — I can't show you how easy it is up here, if you go down to the booth, you can see how easy it is to use the CheckFree wallet.

I want to end — you'll get to see my screen there — I want to end with four key points. Get started now, determine the criteria for what success means to you and what partners you will use to get there; be prepared to fail, try again; and learn and fail again and learn and try again, because you will. And finally, celebrate whatever little successes you have as they occur, because this is not easy, it's hard work and you have to step back and enjoy it sometime.

Thank you.

David Fox: Thank you very much. We'll [take] just one question, if there's just one burning question someone's got, and then we'll move on to Pierre Wolf from First Virtual. Yes.

M: [inaudible]

Michael Slade: The merchant. Again, the merchant pays to receive payments today. He pays credit card rates, he pays to have checks deposited in the bank. You wouldn't dare catch me quoting a price in [an] audience where there's 300 people.

M: [inaudible]

David Fox: The question is: "How do the consumers register?"

Michael Slade: For credit card payments, there is no registration for the consumer. You get the wallet just like you would any other, a physical wallet and you load it with the cards that you choose to use to make payments, you put in your driver's license, which is essentially your shipping address. And there's no registration. When we add electronic checking in release 2.0 in June of next year, there will probably be a registration because the consumer protection available for checking account transactions is not as great as consumer protection for credit cards. We're very concerned about that, so there will be a registration process.

M: [inaudible]

Michael Slade: Sure. We are accepting image files of your telephone bill if you are a customers from Southwestern Bell, and people who are CheckFree customers can receive that image delivered to their PC. And when you're ready to pay it, you just say pay it.

David Fox: Okay, if we can just hold any other questions until the panel session. Next up, we have Pierre Wolf from First Virtual. Pierre is a great guy and knows a lot about what's going on in the marketplace. First Virtual was the first electronic transaction system that I set up and it's really something that I recommend everyone do. As Michael said, you've got to get started, you've got to become a user to become a seller. And, First Virtual has a great system, it's really easy to sign up for, and I'd really [re]commend doing that. And Pierre can take it away.

Pierre Wolf: I'm going to give you a little background about where I came from and how I joined First Virtual because I think it's important. I started... I was working with Reuter's New Media out of New York City and the task that was set was to start looking at the commerce opportunities for Reuter's on the Internet. I was in business development and it required meeting all the big companies who were doing things on the Internet as well as a lot of the start-ups. It was really interesting to see when I started investigating this in early 1994 that...

[Tape Change]

Pierre Wolf:... then about October of 1994, out of nowhere, I hear of this company, First Virtual. I'd never heard of them before and all of a sudden this became an issue. These guys weren't announcing something they were going to do, were announcing something they had just delivered and that piqued my curiosity and right away we set up meetings with them.

What interested me about them was [that] looking at the group that was behind this, the scientists that were brought together — how did this group come up with this pseudo low-tech solution? It's an e-mail-based solution. And, why would they have proceeded with that direction, especially with their backgrounds? Nathaniel Borenstein is a Ph.D. from Carnegie Mellon, he's one of the co-authors of *Mime*, if you don't know what *Mime* is, it's the multi-part Internet mail extension. It's used to transfer files — different types of files — across e-Mail.

Also, Marshall Rose was the author of SNMP, which is a simple network messaging protocol. And these are two very significant protocols on the Internet. And again, these guys were really bright guys, so why didn't they proceed with an encryption route?

I'm going to back up a little bit. I'm going to tell a little bit about the company in terms of background of why it got started, and how it got started and that will bring us forward to this. Now, first of all, I want to tell you that every time I do a presentation it's very spontaneous. Even though I have a slide show, I never know what I want to talk about. And it's because there's so much to say about the subject that twenty minutes doesn't do it justice. And in an hour, I can probably convince you that First Virtual's the best thing to do, but we don't have an hour, so I'm going to hit some of the key points and not trip over myself.

First Virtual got started by Lee Stein, Einar Stefferude, Nathaniel Borenstein and Marshall Rose. The meeting that happened was: Lee Stein is an entertainment attorney by trade, he had represented a number of rock and roll stars, and he was at LAX airport where he saw Einar playing with his PowerBook. And he came up to Einar — he had just been investigating the Explorer CD that Peter Gabriel was about to come out with, but he had been looking at CD stuff — and he said to Einar, "What are you doing there, is that multimedia?" And Einar looked at him, Einar's about 60/65 and he's been on the Internet since 1975, has influenced all of the e-mail standards that are available today, and he looked at him and he said, "No, it's the Internet."

And the analogy there is, it's not the bus, it's the highway. So, Lee proceeded to discuss with Einar, and said, "Where's the money on the Net?" And Einar crudely answered him, "Joke of the Day." And, actually I read somebody else used a similar example, actually in the *Out of Control* book by Kevin Kelly. But, the idea was that, if they could sell a joke a day to everybody on the Net for a penny a day, the economics of that would be pretty fantastic.

Lee, having an entertainment background, has a lot of contacts with people in the industry, so to him the Joke of the Day was nothing funny, he could actually realize this. And when they did the economics on the plane, they realized that they could afford to hire the Letterman writing team, the Tonight Show writing team and a number of other famous comedians to write the jokes for this particular product. So, content became instantly what they realized, that if they could sell low-value information on the Net — easily over e-mail, because e-mail is the largest common denominator — they could do a really good business.

All right, so that led us into [inaudible] as a result they realized that the opportunity was in content. They brought in Nathaniel Borenstein and Marshall Rose to start figuring out how [to] do a system that could be a commerce-based system on the Net and accept payments for this type of thing. In designing the payment system, they realized, "What a great idea — why

don't we forget about Joke of the Day, let's make a payment system company! Nobody will take us seriously if we start doing Joke of the Day."

As a result, they developed this payment system which really was addressing their needs for a particular application [that] they saw widespread usage for. The focus of the payment system was not to be a payment system for everything — it wasn't about hard goods, it was really focused on information and intellectual property products over the Net. Things that were deliverable over the Internet.

Part of the issue is that we're dealing with sight-unseen products. When you purchase something that you can't see what it is, as is often the case in mail-order, or telephone order, there's a high percentage chance that it gets returned — certainly higher than if you had seen the product. As David and I believe Cliff mentioned earlier, there's a charge to the banking network when that happens, which can cost up to \$50. To the merchant, it can be resolved into higher discount rates, as well as fees for chargebacks. So, the system was set up to try to address this as part of it. I believe [inaudible] people just haven't understood yet how to do commerce over e-mail to really take full advantage of it.

Our system runs over the Web, as well as over e-mail. But the key is that the focus we see, is that, for example, direct-marketing opportunities are something that today are not easily accomplishable with the existing payment systems — but with ours it's pretty simple to do.

An example would be a subscription system. Let's say I had a magazine subscription and, as a publisher, on the 11th month, I would send out a renewal form to my customers. They would then check "Yes, I want to renew," they'd put a stamp on the envelope, they'll put the little piece of paper into the envelope and they'll mail that off. Okay, that could be anywhere between a week and two weeks turn-around.

In the First Virtual world, what we would do is we would call this a merchant-initiated transaction. The merchant could initiate a transaction to the end user saying, "Do you want to buy this, 'yes' or 'no'?" That is because the merchant has the virtual PIN number of the user, and can use that to initiate the transaction. The consumer, at that point, would decide whether or not they wanted to buy. So a simple answer of "yes" or "no" to the question would fulfill the transaction. It's immediate. Now I need to explain a little about how First Virtual works for this to make a lot more sense.

First, we'll deal with the mission statement that Lee Stein had come up with, and it's basically where we are. [It] is: we're a financial and marketing company created specifically to enable safe, global electronic commerce by anyone with access to the Internet. In addition to that, it was important to be low cost, affordable, and that anybody be able to become a merchant on the Internet and accept credit card transactions. We do this by assigning a virtual PIN number.

So in other words, the credit card information never actually travels on the Internet on our system. What happens is the user comes to a site, they register, they pick an eight to 24 character I.D., then we send them an e-mail saying to call this 800 phone number and it's an automated system which will allow them to provide their credit card information over the telephone. Once that's done, we send them an e-mail saying, "Your account is active, and from now on, any merchant who accepts First Virtual, you can transact with."

To give you a little feel for our growth: currently we have approximately — I believe we've now crossed the 700 merchants on the system. We have, our user growth, we've crossed the 40,000 user mark. We're growing at the rate of 12% to 16% compounded weekly, which is very shocking and very strange to look at when we see these numbers on a weekly basis. Growth is phenomenal, so we know there's a need and a desire for people to do commerce on the Net.

The number of transactions per week, right now, is up around, I believe it's crossed the 8,000 number as well, and that number's still fairly low. What we're seeing is that it's still driven by people who are going to a site, want to purchase something, [see] that they need a First Virtual account to purchase it, go get it, then buy the item. So today, it's still people coming in to buy one thing, but they have a PIN number and it enables them to do recurring purchases. It's probably about an average of 1.4 items purchased per person so far.

Okay, I'm going to give you an example of how a First Virtual transaction works, it usually helps visualize how it would work. Reuter's new media has a company called Reality On-line, and Reality sells premium financial reports on publicly-listed companies. So, when you get this, there's a certain page on there where you can order these premium reports. They accept First Virtual, you go in and you put in your PIN number, and you select the symbol that you want.

The PIN number, by the way, although it's hashed, doesn't need to be. A First Virtual PIN number is not a hidden number, it's not a secret I.D. or a password or anything of the like. And you'll see why because of the process. So the report would come down, and then the — Okay, this is what the merchant sees once the user says, "Yes, I want to pay for this." Because prior to this process, what happened is after Reuter's sent the report back, they sent First Virtual a message saying this consumer bought this product for this amount of money, and we now need confirmation that they're going to pay for it. So the confirmation would go to the user and they would then answer "yes," "no" or "fraud," which are the three possible answers to the query, and then we send this upon the "yes" answer — this is what the merchant would get back — letting them know the consumer will be paying for that product.

One of the things that's interesting with a "yes," "no," or "fraud:" "Yes" means, "Yes, I want to pay for it." "Fraud" means, "I never made this transaction, somebody's misusing my card," and so we'll automatically suspend. The "no" is always a tricky one, because in sight-unseen materials, "no" can be one of three things. "No" can be, "I received the information, but it wasn't what I ordered, or what I thought I was getting." "No" can be, "I purchased and the download on its way down broke and the merchant may not have known that that happened," and the third "no" would be, "I purchased it, it's exactly what I want and I'm just not paying for it." And I'm using the "no" mechanism to say "no" instead of "fraud." That third "no" answer, we have some fraud detection software within our system which evaluates the merchant's site against the user's past behavior. It is not a manual process — it is a fully automated algorithm that we have and we're constantly refining.

So far, we've been about 80% accurate, in that for the people that we've gone after, about 80% of the time we were right, about 20% of the time it was an error on our side — where they legitimately went three times and said "no" and it didn't work.

But we're constantly refining it, and like I said, by about the third "no," we're finding those people. From the merchant's perspective, though, information products do not have a cost of goods sold. They have maybe the temporary "line-con" that you would use on transfer of the information, but you have a sub-cost when you produce an information product.

And, whether you sell one, or a million, your sub-cost is the same and your cost per good sold is not happening. So that if they do lose, let's say for example Reuter's downloaded this, somebody was defrauding them, and they said "no," — the maximum lost was just the opportunity costs. And chances are, if the user had to pay with a credit card, they never would have initiated that transaction if they were really looking to defraud the system. Even those types of "no's" are not incurring a real cost to the merchant.

Unfortunately, this did not come out so well. Apple was selling *QuickTime* using First Virtual — they recently pulled that out as a result of changing their software strategy and we expect to see a number of other things that they will be doing using First Virtual. But basically,

you would go to their site and you could buy a First Virtual *QuickTime* on-line. Basically the message would come back — this is what we send to the user — so it says, “Apple Link has requested that Beverly should be charged \$9.95.” At which point Beverly would clear out the body of her message and answer “yes,” “no” or “fraud.”

This summary here, once we’ve hit the credit card, which sometimes we don’t do right away, so it may be a batch operation and — actually this is a batch operation — it can take up to one or two days before we literally hit the credit card. There may have been several transactions that are accumulated there. But once we hit the credit card [or when] it went past \$10.00, we hit the credit card and we send the message saying that we’ve hit it.

This message also has a tracking number, which will appear on your credit card statement. And, actually, I believe that on your credit card statement, that initial tracking number up front only says — it’s only a one liner — it says, “First Virtual,” but that tracking number contains all of the information behind that. So you can query our server for it, but we also send it automatically once we’ve hit the credit card.

Okay, so the way we look at this is that first, when mail-order was introduced, these are all sight-unseen credit card transactions. When mail-order was introduced, the validations that were brought in were address verifications, for example (early fraud detection). Address verification, if you’ve ever tried to buy an airline ticket, for example, and you give them an address other than your credit card, chances are you won’t be able to do it.

Telephone order introduced the ability to do on-line authorization, so it wasn’t after the fact, it was right there, when you were giving your information. And First Virtual adds another layer there, which is really bringing in a[n] authentication by e-mail so that, for example, if somebody had misused your card number, or your PIN number, you would have known right away. As well as the fact that we’re using the PIN number for validation — enabling the merchant to quickly check that your PIN number is an existing PIN number and then, finally, that we get instantaneous fulfillment of the product, so that you don’t have to wait to have it shipped to you later on.

What I want to hit next is the actual First Virtual process, looking at it from a chart perspective. So, what happens here [is that] the customer will give the merchant a pin number, the merchant sends to us the information, which is the customer’s pin number, the merchant’s I.D. number, a summary of what was purchased and the total amount of the purchase.

We then take that and send it in the form of an e-mail to the customer. The customer, then, replies to us with the “yes,” “no,” “fraud” system. And, if they say “yes,” we then batch it down to [a] secure credit card system. This batch line is a custom protocol and it’s a batch protocol, so it’s uni-directional and does not actually sit on the Internet. The machines below this line, we call the “below-the-line” system, as opposed to the above-the-line system. The below-the-line systems are not on the Internet, so no credit card information is ever exposed.

First USA is our acquiring bank, our merchant bank, so that once we’ve passed it through the EDS system, it will go to them. We would then... the money transfer goes through our ACH transfer agent, Northern Trust, and they’re the ones who actually do the bank transfer. Then, eventually to the merchant’s bank account as well as to ours.

The transaction cost to our system is 2% plus \$.29. The 2% represents the standard credit card discount rate. For most credit card merchants, the rate is anywhere between 1.25%, depending on how large [the] volume — department stores for example — to mail order, where it can be anywhere between 4 and 5%. So, we do 2% for everybody, regardless of the size of the merchant. The catch here is that in the case of small merchants, who would not normally qualify for merchant accounts, we have a 91 day hold that First USA imposes on the money. And the reason for that is because then each consumer has a capability that within 90

days of a transaction, they can cancel a transaction completely. If that were to happen and we had paid the merchant... well, let me give you a scenario.

The scenario is a number of customers and merchants collude against First Virtual. And the way they do that is they initiate a number of transactions, all the customers say, "yes," and then it goes down to the credit system, and everything is okay. We pay the merchant. 70 days into the transaction all the merchants go out of business that were involved in the process. 80 days into the transaction, all the customers that bought that product come back and say, "We want our money back." And so a chargeback occurs — First Virtual would be held up there.

Now, while I worked with Reuter's, that was a problem for me to see 91 days holding that money. The cost of money to us was a little too big for that. So what we were able to strike with First USA is an arrangement, that, if a merchant is able to qualify for First USA's merchant account, at that point we would do immediate settlements.

So, what that does, is that, for the larger companies that already have merchant accounts established, they're able to deal with it in our system and get immediate settlement. For those smaller merchants, who are just starting out or who are individuals who want to sell products, they would go through the 91-day route.

So we have a number of strategic partners with us today, First USA being one of them. And, it's mainly because the First Virtual PIN system addresses the needs of a lot of these people. In the case of the banks, like I said, especially the banks — with these chargeback issues — by being able to say, "no" to a transaction before it ever hits the credit card, it enables them not to have the chargeback cost that is associated with that.

Until recently this had been one of the problems that we had seen that First Virtual really addresses well, and it's the issue of browser security at the end.

The information traveling between the two points may be secure, but, what happens to the credit card information once it gets decrypted in the merchant's machine? If the merchant is not running a 24 x 7 shop, we were concerned that that's a point of attack. And in the case of the CERT, which is Carnegie Mellon's Center for Emergency Response Team, they issue about ten batches a month right now to HETP servers and things of that nature. Which to us, is again, these are exposure points, that when you're not holding credit card information at that end, and only PIN numbers, you really don't have anything to worry about.

(This should read STT.) This is a slide that we normally use just to illustrate what the STT protocol looks like right now.

Now in the issues of security, this is something that we kind of take pretty seriously. And, we have a couple of opinions on it, and I want to share those with you because it's relevant to what we're talking about.

First Virtual is a process-based security system, as opposed to a technology-based security system. And what I mean by that is that, what we're relying on in encryption security is that the technology is sufficiently strong enough to protect from intrusion of the information. If the encryption wasn't there, then the security systems wouldn't work.

First Virtual's system is process-based, which means it doesn't rely on the technology. I could do the First Virtual process — that I showed before — with a telephone, and if all the parties had telephones, I could do the entire thing with telephones and it would still work. I could deal with a telegraph machine and it would still work. So the bottom line is that it's not the technology that we're counting on — it's the process that we're counting on.

As part of that, for example, if you wanted to defraud the First Virtual system on a large scale, you'd have to basically hold onto every... have access to everybody's e-mail account, and be able to lock them all out of receiving the e-mail from us.

And, again, in a technology-based solution, if I understand how to break through the encryption and/or find the bug that leads me to getting to that information, then one of the

fraud issues that I think is the biggest is that I could hit every credit card one time for a small amount of money and never hit it twice. The credit card fraud systems are not set up today to deal with that type of fraud. They're set up to deal with abuse of one card, but not abuse of multiple cards for low amounts of money. So this is another issue that I think is being brought when we deal with security issues.

For those of you who were able to get the folders at the back of the room, I have a copy of all the slides in there. If I didn't get one to you and you'd like one, please give me your card, and I'll make sure you get one when I get back.

Okay. So Lee Stein, he's our CEO currently. And Marshall Rose, as I mentioned before, he's the author of SNMP. Daniel Borenstein, author, co-author of Mime. Einar Stefferude, he and Lee were the two who really got this started. Einar recruited Nathaniel and Marshall.

Okay. I think I'm done right now. Sorry for the awkwardness, but thank you very much.

David Fox: Now, if you've got a couple of questions for Pierre, then I'll introduce Robert Hettinga. And while we're taking those questions, what I might do is just pass around a small box, into which you can put your business card. And again, we've got a couple of copies of this *Digital Cash* book, [inaudible] by Peter Weiner on AP Professional, if you'd like to win one of those two copies, I'll pass around a box. In the meantime the questions for Pierre.

M: So, what happens with Joke of the Day if you have \$.29 at 2%, are you effectively shut out of small...

Pierre Wolf: Yeah, and the problem was that when we, did this system, we went for the lowest cost possible. It cost... the merchant cost \$10, one time for you to register. It cost the user, consumer \$2, [as a] one time fee, and with this 2% of \$.29, that was the lowest we could do and still make it work. So that a lot of times we get a lot of static, "Well, can you waive the \$2 fee, can you do this?" These were all the lowest numbers we could reach and still make the system essentially work.

M: So is [it] still aimed at small information...

Pierre Wolf: Yeah, what we recommend for those people is that they use an aggregation model. So that they aggregate the transactions on their local server and maybe, say, every \$5 or every \$10, bill the consumer, or make them pre-pay and work off the \$5 or \$10 until they get...

David Fox: I [inaudible] the questions and I'll introduce Robert Hettinga. Pierre Wolf commented to you [inaudible] that you get more e-mail from Robert than anyone else. [inaudible] some interesting views on [inaudible]. Make a couple key points and then we'll take another question. [inaudible].

Robert Hettinga: Hi, I'm Bob Hettinga. First of all, now that half of the people have left the room, why don't the rest of you get up and stretch for a minute. How's that? Might as well take a break right [here].

M: We're going to be here that long?

Robert Hettinga: We're not going to be here that long, but I figure I'd give you all a break.

[A several minute gap in the recording occurred here.]

M: [inaudible] I'm always very annoyed when I do not receive an invoice if I pay by credit card, but I don't receive a receipt or an invoice, which I can hand in on my tax report.

Robert Hettinga: So that's my question essentially. How do you take international...

David Fox: Okay. Well, each of the members can address that, starting with, starting with you, Cliff. I understand the point of being formerly... being an international person myself.

Cliff Utstein: From an international perspective in the architecture — where the front office is separated from the back-office — we are currently working with transaction service providers in Europe and in Asia to run back-office services. And those would be customized for the habits and in models that the consumers and the businesses are currently using in those locales. So, if they wanted to send the credit card over the Web, they could.

But again, on the back-office model, you can do it by fax, or you can set up your accounts via telephone or another mechanism. So, as soon as the transaction servers take the back-office in Germany, you're set. There's no additional encryption required. The digital offers and digital receipts in the front office/back-office, are not encrypted. They're actually just hashed, using an MD5 hash, and that's fully exportable.

Pierre Wolf: First Virtual is currently... our system has been [inaudible] in its infrastructure it supported multiple languages and multiple currencies. We're currently have a discussion list right now, because we've had a lot of interest from outside of the U.S. In that list, we're discussing what are the issues in so far as card activity to the banking networks, that need to be addressed in each of the different countries.

Today, I'd have to say that the Japanese have been the most aggressive with us in so far as getting the stuff.

Michael Slade: CheckFree is already processing, on a pre-authorized basis, local currency transactions in the U.K. Beginning in three weeks, we also launch [a] service in Germany and France. By the end of the first quarter we'll be in nineteen countries, both in Europe and in the Far East.

All the issues you raised represent a tremendous learning challenge to anyone that's going global. It's not just a payment processor, but it's also the merchant as well. And notice I said, "Global." There is a difference between being global and being international, because you have to learn the protocols and rules of doing business in each and every country. The problem is that the infrastructures and the regulations are very protective in any country around the world. And that, [as] David mentioned earlier, the regulatory world hasn't caught up with the market realities. And that's very true today.

The CheckFree wallet — even though the existing protocol we use has been certified for export by NSA — it's a 768 bit key. That's not half bad. The problem is, is that there are very different rules and requirements around the world. And if you're going to do business globally, you'd have to be proficient in doing all of those, and we're learning.

David Fox: And we'll take a final word from Robert...

Robert Hettinga: Oh, God.

David Fox: On this global...

Robert Hettinga: Giving me the final word.

David Fox: And then I'll, welcome [you] to come up and talk to us individually.

Robert Hettinga: There is a concept that we talk about on the Net called regulatory arbitrage, and that is: moving stuff to different jurisdictions. Having to deal with the fact that you've got all these governments, which really don't know anything about the Internet, and are trying to regulate it. There are lots of problems with the rules out there, and the problem is, of course, the network doesn't have a lot of rules. And the more rules you put on the network, the network tends to treat it as an obstruction, and it tends to route around damage. It tends to treat censorship for instance, as damage. So we have a problem, but it's not a problem that we can't handle in the long term.

The other thing about currencies is the new iteration, the first iteration of Digital Cash came out of Mark Twain Bank in St. Louis and they have, the accounts that they have, you can put in seven or eight different currencies, and I also believe they do it in the Deutsch Mark, so you can get around it a little bit that way.

[Tape change]

David Fox: You're welcome to come up and speak to us individually. And good luck in your transaction search.

INTERNET TRANSACTIONS SECURE COMMUNICATION AND COMMERCE OVER THE INTERNET



MODERATOR

Bill Washburn

Senior Vice President, Internet Business Group, Mecklermedia

SPEAKER

Amir Herzberg

Manager, Network Security Group, IBM T.J. Watson Research Center

Bill Washburn: Ladies and gentlemen, I know this isn't a session or series of sessions about the ins and outs, the research on audience geographical distribution in a room; I want to advise you, however, at this point, that the presentation will be on overhead and therefore will only be visible on the screen to my left, which I believe would be your right. There's plenty of chairs to that side of the room so feel free to take appropriate advantage now, or later if you wish. That's entirely up to you.

I certainly hadn't intended to introduce Amir only to have to depart the room, but unfortunately I am, for better or worse, serving double duty with the news media, and it turns out that there is rather more interest in the press of various sorts than anyone had anticipated. I have to do some other things while this is happening, so at this point I'm going to just say welcome to you and this will be an interactive session to the extent that this is appropriate for the speaker and for you. I'm sure that you'll be able to work this out amongst all of you — after all, we've had all that training in how to be good students. Unfortunately it keeps a lot of good interaction from happening, but maybe this won't have to be so today.

Once again it's a pleasure to welcome you to this series of sessions, and in particular we're in the session called "Secure Communication and Commerce over the Internet." We all know, everybody's talking about commerce on the Internet; I would only — maybe less, for now — with respect to the Internet, in the sense that there are so many ways to be valuable as a Web operator or to have value in a Web and Internet environment within the commercial community without trying to do commerce in the business sense of exchanging money. Nevertheless, that's not what people like to hear about, or at least like to talk about, it seems.

So I would like to introduce Amir Herzberg, who is Manager of the Network Security Group at IBM, at the T.J. Watson Research Center which is in lower New York — although it's called upstate New York for some reason. I'm from the west and it struck me as interesting about that Westchester county area being upstate New York. So ladies and gentleman, thank you very much, [and here's] Amir Herzberg.

Amir Herzberg: Thank you. I hope everybody can hear me and I hope you will know that you can see this, and since we're such a small audience here I would welcome very much any questions and so on, you're very welcome to ask. I suppose that the reason that we actually have a big crowd is that this is a double feature. We have two things here, secure communication and secure commerce.

Before I begin I'd like to give a small overview of what my group is, just so you understand better who you're talking with. I'm from a managing net for the security of the IBM Resource Center, one of our resource centers, and my group is focusing on actually applied cryptography, one would say, which includes actually focusing on Internet security and electronic commerce, and not just on the famous [inaudible]. We see commerce as a much bigger thing, but today we would focus on the payment part of it, which is an important part of what we are doing.

Other areas we're working on now include secure mobility and cryptography in general, including theory and [inaudible] cryptography — we're doing a lot of work in this area. And one particular example of our advanced work in cryptography is a new earlier [system] which we have kind of created or are creating, which we call "proactive security," where we investigate methods where you can have security without a series of any single server — any single point in your system that is secure forever — but actually distributing your security among many different sites and running protocols periodically on all these multiple sites, pictographic protocols, so that even if every site could be broken the attacker really has to break into all sites at the same time in order to break your system.

So this is just to give you a bit of a flavor or where I'm coming from. I'm coming from really advanced research in cryptography, but also trying to find applications and help IBM products and customers.

So what we're talking about today is a double feature. In the first class we'll talk about advance results in securing communication across the Internet, where essentially I will focus on a particular mechanism — if you're securing communication in the IC layer between two IC networks or two IC hosts, which is a reason [for an] Internet engineering tasks for the ICF, which is [the] Internet group trying to establish a standard as to how we do this, how we secure the communication across the Internet.

We are involved in this process, so I will describe that briefly to you. Then I will talk about — in fact I will put more of our time in discussing security for electronic commerce, and in particular for payment. I decided that of the two parts this should take more of the time for the simple reason that I noticed they put me on the transaction track, so I guess everybody decided this is the topic I should focus on. And then there are recent conclusions; but I will try to actually leave some time for questions at the end. But you're also very welcome to put questions into the middle if you want to.

The first question when we look at securing communications, security in general on the Internet, is what is the right layer? Where should we position security services? Here's a traditional question that people are debating about. In fact, it's a very important question, and if we had the time we could spend a big chunk of the talk just on this point; it's one of my favorite ones. But we won't.

What I want to point out to you is that security actually should be embedded in more than one layer. In some ways security in different layers can complement each other and have different advantages. Some advantages are things we should have for a conditional period, but it is maybe meaningful to have security some place until we can have more products in the different layers, some things that are really there to stay that we really need even in the long-run security mechanism in different layers.

As we begin the application layer, traditionally we say that it's best to have security in the application because it really deals with the end-data of the user, and that is true. In fact there are some security functions that you can do only in the application because they are really very much related to the semantics of your data. For example, signature — you don't want to sign everything that you send out. In order to sign you have to know what you are signing. In fact, it may even — and I don't want to get into the [details] — but in some cases, if you sign things without really being aware of the need to sign these things you may do a disservice to the user and even cause security problems. So signatures are an example of something that you can do only in the application layers.

And there are other examples, like very strong encryption and things like that. However, there are disadvantages in doing things in the application layer. One of them is efficiency. You have to do things only in the application. Another [disadvantage is that] it's difficult to gateway, to drive a central point like a firewall or something similar where you

provide the security for the entire corporation. This is something which is difficult to do if we do encryption in the application — namely, to capture the transaction on the way. To get it up to the application at the firewall is a difficult process. Also it will require us to change all applications and to trust that the user would, in fact, change all applications.

So for things which require knowledge of the semantics of the data, it is more efficient and more secure and more manageable to put security in a lower layer which will capture all of these things together. It's one chunk, and that's really what we talk [about], a secure tunnel between the two sides or between the two networks and so on.

Now, when we talk about having something like that, just a pipe or a tunnel to provide security, we could still do it in different layers. We can do it at the [inaudible] layer, which is what SSL, for instance, is doing. It's a thin layer which is close to the application, it's relatively easy to implement, and you don't need to change the [functionality] of your system, it's easier to implement. But it still has also a lot of disadvantages of doing things in the higher layers; it's less secure, you're still depending on lower layers being secure from hacking attacks and so on, it is less efficient and so on.

And that fallacy, that there isn't a standards body which has essentially adopted what we want in the long term... Is there security in the IC layers? And in fact, that is what we're interested in going towards, because it provides you with highest security and highest performance. It's the cost of requiring all vendors to implement the same thing, and that's the small comment over here; to do this efficiently we really need a standard, and that's why we work very hard in this body to reach a standard agreed between the different vendors.

In fact, right now you can go and buy many secure firewalls that would provide you encryption capability but unfortunately don't interoperate with each other, except for the upcoming firewalls which would support this Internet standard. Ours is one of them; ours is actually already available. It's [release] was exactly last Friday, and I know at least one other company which we've already tested interoperability with a [inaudible] and I think that they are going to be out there very soon. I didn't check with them exactly about what was the date. We're working a group of many firewalls to make sure that all or most of the firewall vendors would, in fact, gradually implement this standard and interoperate.

But the standard, by the way, is not limited to firewalls, and certainly we hope that we and others would implement it also in end systems. Just a small mention; why don't you go even lower in providing security at the link layer? The reason for that is because we don't control the internal links of an Internet, and therefore we cannot really go lower than the IC.

So what we are talking about is secure IC coming in over the insecure Internet, and what we are working at is to implement this and to service the Internet standard in the IC [inaudible] group. And this is two main things, the distribution of the [decryption key], so it's key management, and then encryption, which is done by encapsulating the IC circuit in an external IC circuit, so it's IC and IP encapsulation. And the standards wouldn't allow us to use either public key distribution or a key distribution center like [inaudible].

The standard does support both of these options, and it could be used for secure [inaudible] communication or for private venture networking over the Internet. And the emphasis is on openness, of course, on security. In fact, the standards really take very high walls in security, which I'll talk about briefly, and efficiency. The figure will look something like this. Okay, it will look something like this, and you could have two sides and they are connected with this firewall or with encryption tunnels, and they secure all the communication between them. And this is actually a miniature firewall in a home device or a mobile device or just an end machine, so you could have it also, of course, inside the organization.

Just one example of something that this will prevent against. We recently heard about this Berkeley student attack against SSL and file systems, other security mechanisms which used

a network snoopers essentially to inject messages into the network and change software with a slide. If you had an IC tunnel between the end systems and the file server this would have been impossible.

A few words about the requirements of these protocols. The first word of these wonderful [inaudible] is simplicity and so on, and their action is the same as we always look for in an Internet protocol. We always want these kind of things in an Internet protocol. The second is really the focus of this particular working group, and we really decided in the working group to have high security requirements from this protocol; this is like the base security protocol of the Internet. It will be a part both of IC [inaudible] as an extension, and early from the beginning in the next generation of the IP, IP version 6.

So requirements are really strong and the design is based on very conservative principles and conformance in a modular way. The design would allow us to replace any components if [they are] broken, and allow us to [take care of] some greater concerns. The design improved some sound mechanisms for recovering from exposure of [inaudible], limited recovery from exposure, which actually relates to, if you remember, the beginning of working on proactive security and recovering from exposure. But this is to a much more limited extent.

In fact, we are just in this day finishing the theoretical design of how to do proactive security for communication, so this of course is not meeting the standard. There is contained protection against somebody just sending you a lot of garbage and trying to cause your machine not to be able to handle all of these connection requests. Remember that cryptography and public key management in particular involved substantial overhead and computationally expensive operations, so we have some mechanisms to prevent somebody from sending a few messages and causing us to waste a lot of cycles. There is some cloning protection, and there is some on the limited mechanism in the protocol.

Now, I can go into details on the design, but I think I will not do that. I wanted to talk some more on the other features of the talk, so I'll just hit on the status of these things. The encapsulation mechanism for packet encryption and authentication are at the first standard level in the Internet if you [inaudible] standard. So it's an RFC, it's a standard trick, and it's a first level of the standardization process. It could still be modified, although we don't expect substantial modification.

The key management aspect we are still converging. We hope to converge to a standard [inaudible], and we are trying to reach that goal. My hope, my customers' hope, is maybe that at the first opportunity next year we'll have it standard. But even before we all have interoperability at least we've [established] our key distribution between systems. And that's what we are doing, as I said, with some other vendors.

Performance is really very good, very satisfactory. We have already one product announced and available, which is the IBM Internet Connection Secure Gateway. You can get more information on it downstairs, or actually I have a few sheets with me if somebody's interested after the talk. And as I said there will be other interoperable products from different inventors. Any questions on the first feature? You can wait until the end of the talk, of course.

M: [inaudible]

Amir Herzberg: Well, we have many customers. The question was, why would anybody care at all about interoperability between different firewalls? And the answer is that we have many customers who would like to... Even in their own network they may want to have different firewalls for different parts of their organization, and then they may want to have the flexibility of buying from more than one vendor. Actually, a lot of our customers are very concerned about open systems and allowing themselves this flexibility.

In addition to that — and very importantly — you could actually use these secure panels to connect to another company which has selected a different firewall, so maybe you have the hope of establishing this new company. You only buy IBM firewalls, and that's a wise quality. But maybe there is some other company, not to mention the possibility of your CEO suddenly overtaking another company, where this other company — we're familiar with this problem — this other company would buy someone else's firewall. Well then, wonderful, they do interoperate. You could actually secure a communication with this other company across the Internet. So this interoperability is very important. We hear it from our customers all the time, they care a lot about that.

And for firewall vendors, talk with me afterwards. There is a firewall vendors mailing list and we are working together trying to have this interoperability among us, and other vendors who are not involved and would like to get involved are very welcome. One more question now, and then some at the end.

W: [inaudible]

Amir Herzberg: Yes, our products will have an exportable version which will also have encryption, but weaker encryption, unfortunately. It's not that we want to do, as you can easily imagine. But yes, the encryption option that is outside the United States would be weaker. It would have encryption but it would have weaker encryption.

W: [inaudible]

M: Well, you would have it with the weaker encryption. However, if you would want to use a strong encryption — actually, we are trying to find solutions to that. The best solution, of course, is for all of you guys immediately after this talk to write a letter to your congressmen, and that's the best solution. And we are working on that solution with our congressmen; IBM as a corporation is doing that. But more people should do that. I think that these export restrictions are not helping the United States. But yes, we are limited, and maybe, however, other vendors from outside the United States may also make this an interoperating standard. Again, other companies would be able to buy this from other vendors. Unfortunately, I hope they'll find there isn't a vendor — and there are some other good vendors — and then they will be able to interoperate with our product in the United States.

Now let's move to secure the electronic commerce. So we believe that the Internet is a very vague thing, actually. The way that I see the Internet is that the network receivers can communicate within this, and the network can send messages to other people who are connected to help everybody understand the Internet. So it's clearly a very fuzzy thing. People say, "Why isn't Internet on cable TV?" My guess is cable TV will be a part of Internet when data comes to cable TV. So this would be if the marketplace were the [inaudible], and I say this in the broad sense of the word. We see this as a huge condition in the business, in the same way the entire computer marketplace is much more than computers. So it's a very big thing.

And we want it to work, we want it to work as soon as possible and as well as possible. We believe that for us, IBM, the number-one benefit will be if this market really doesn't go in the open where it's unrestricted; then we will gain a lot from this, because we have a lot of services that we offer, Internet services, Internet connectivity services, IGA. We have many Internet products, we have hardware products which will benefit from this. And of course we've got software products.

So what we want is for this market to flourish; we don't want anybody to stop it. Security is one of the major concerns so want to address that, and in particular secured

payment is one of the concerns we want to address, and that's what we focus on today. And our goals are to have an open market, to have standards and interoperability. That's really our focus. We don't want to gain a small advantage to our sales, but then help this market much more. Because we believe that all will benefit if this market will grow and flourish.

One of the things we also want to do to make this market flourish is to look carefully at migration — how we enable people to move from what they are doing today to what we want we want to enable in this electronic marketplace. So this I will focus on, and you will see that also in our design it is a big focus.

There is [inaudible], and in the short term we want to keep it simple and focus on 20% of the problems, which will give us 80% of normal activity. You know what I mean. Therefore the conclusion for that, our conclusion is that we begin by focusing on charge cards, providing the payment solution for charge cards. We feel this is the simplest thing to do because it's a common mechanism that everybody is used to, and you extend the distances that people are used to having to pay.

Still, we are used to paying over the telephone with credit card, and that's a basic thing. The credit card is the basic mechanism to doing payment electronically when you don't have a face-to-face interaction. It doesn't mean that we don't try to support other mechanisms that work, and you do — we are involved in other efforts as well.

So how does that look? How does the credit card picture look? Okay, [with the] electronic banking system, the credit card electronic banking security is almost like this. We have the buyer who is the credit card holder and the seller. Now, each of them has his bank; the buyer's bank is the issuer, the bank who issued you the credit card, and the seller's bank is called the "acquirer" — for historical reasons we think it's called the acquirer of the seller.

The bank is essentially giving the plea to go get the money. And they connect with this information network, and this is an example of our migration approach. This network always exists so we don't try to change it. If it's something that exists we don't try to change it because it's much easier to build on what exists. What is different is not that this buyer, seller and acquirer try to talk on an open network, an insecure network; and the buyer has to somehow pass the money over and get the services and goods [through] this medium.

So that's what we're going to change, we'll do it [inaudible] between the buyer and the seller. And this is part of our main work, the certification forces, which certifies public [inaudible] of some of the parties, as necessary. So it's mainly this new path in which we don't have so far [to go], although it may be operated by probably the credit association, but it is not a good thing today. And see all the calls here, which is for some fancier aspect of the protocol. You can actually prove that you bought or didn't buy and so on in this protocol, because you really get a signed receipt and stuff like this. So you could actually say that the call system is, in some sense, layering the protocol.

So there are many... Actually, why are we doing this? Because there are so many proposals. Why should we just add more proposals? And this is just a very partial list of some of the payment systems that have been proposed or built, and so when we came to this we didn't necessarily say that we needed to do anything, but we realized it's not the case.

We found out that these general security mechanisms work end to end between the buyer and the seller, but they really don't provide you with any security above giving the credit card to the seller. In particular, there is no way to make sure that the seller even does this, and it is actually very difficult for sellers to tell buyers, "Hey, I'm not willing to sell to you unless you're using these encryption protocols." For the seller there isn't much of an incentive to do this if you think about this and the risk mode very carefully. The incentive is really for the creators of Communism, and the seller doesn't mind.

So we need a mechanism that will give the sellers an incentive to be more secure. Well, one incentive that we do provide to the seller — actually, there will be two incentives that we will give to the sellers, and I'll describe them afterwards — between giving advantages to the sellers over just using this basic seller to buyer security mechanisms. And these will be incentives for sellers to actually move to these more “three-party” protocols.

There are [inaudible] solutions and they are most known at First Wilshire, where you just open an account with this new entity. First Wilshire, for instance, performs a check, not [inaudible] but essentially by calling you back using e-mail. They could even use phone, I guess, for calling the buyer back and verifying that this transaction has been done. But this introduces a new cost in the system, a new bottleneck in processing costs in the system, and if you think about it carefully it doesn't really offer you a lot of security except the one fact that these numbers are not equated to a number, which is a very important point; I fully agree with this.

But then if we could have a solution which would be based on the existing system, it will be more efficient and more secure at the same time. So that's why we're not satisfied with this kind of solution. And again, I should emphasize that I'm really talking about what we want to see as these solutions. I'm not saying it's bad to use some of these existing mechanisms right now; in fact, I think that merchants should. I encourage merchants to start selling stuff on the network with the existing mechanisms. Don't wait for the best mechanisms to be available; [start now] and then move on to the better mechanisms when they are available, which would be pretty soon.

There are anonymous mechanisms. Not so many, but there's a lot of talking about mechanisms which provide you not just with payments but with anonymous payments. Using IC nobody can trace your payment and know that you've paid to get particular vendors. Supposing that you really want to buy from IBM but you don't want other people to know about it; then you can [with IC]. It's good.

Now, the problem is that these mechanisms are more complex, and for several reasons we believe it will be more expensive than the existing mechanism. One reason is that you need a whole new infrastructure with a whole set of bigger problems, so again you don't fall in our 80/20 rule in the sense that we believe that the problem of anonymity, the amount of shopping that people are so concerned about is not 80%; it's maybe the 20% but it's not 80%. So we want to focus on the 80% where we want to have a good, efficient mechanism for normal shopping.

But in fact, let me say that our mechanism that we design does actually offer you a possibility to provide a certain level of anonymity, which could be all that you need. We have to see about that later. They do offer you some level of anonymity — but not as perfect as [inaudible] cash, and therefore without all this, of course.

Shared key cryptography solutions have the following very basic problems. If we look at this existing network, if we use the shared key it means that the acquirer must have some shared key with the buyer. However, right now there isn't any trust relationship between the buyer and the acquirer, so we really need to change the relationship of the change that's happening here, although we say we don't want to do this — we want migration, we want to keep this system as it is right now.

So we have to go a public key system. Unfortunately, here we didn't find any published systems. So now it's different, but when we began we published I-KP which was the original name of our proposal. Now it's called SEP because MasterCard, in their infinite wisdom, decided to change their name — so none of them were published. So we said, “How would we have an open interoperative standard if nobody's publishing the protocols?” We've never had it. So we went and published a protocol, and that's what essentially we did.

And recently Microsoft and Visa have also published another protocol, so now we actually have these two, STT and SEP, which are both in this model. They're pretty similar; one Microsoft and Visa, one MasterCard and us and Netscape and GTE and CyberCash and the open market. These other proposals, I-KP — actually I-KP is the same as SEP — and the CyberCash system, where the secure carrier is Netscape who also designed some I-KP, actually have all converged together into the SEP proposal. So all that we need to be really happy is if MasterCard and Visa would somehow manage to agree to converge their two proposals.

[I want to talk] just briefly about SEP and I-KP. To those of you who are familiar with I-KP and wonder what the differences are, believe me [there] aren't many differences. SEP is really I-KP; in fact it adopted the 3-KP model, and now we'll probably also add the 2-KP model. To those of you who aren't familiar with that, "I" stands for one, two, or three in I-KP, where it means the number of parties who have certified public keys. I-KP is if only the acquirer has a public key. 2-KP is if the seller also has a key, so both the buyer and seller would have a certified public key. And 3-KP is also where the buyer would have [a public key].

Certifying public keys solely for the buyers could be a big problem. Many people are concerned that if there is expense involved, if the process is involved, if the customers may be afraid of that and may not understand it, it may take some time to for us to get certificates to buyers.

The solution is that we would begin maybe not with I-KP but begin with 2-KP, where only the acquirers and the sellers get certified public keys from the certification authority. And later we will move on to 3-KP. Somebody could, of course, get the certificate issued in a bank, and that will mean bank-issuing quality, so the issuing bank will decide if we're starting immediately only from 3-KP.

This is first of all a set electronic transactions, and secondly whether it's a 2-KP or a 3-KP it would allow us to have a different pricing mechanism. So these things actually will be cheaper than many of the transactions, and 3-KP will be cheaper than 2-KP because the risks are lower. That's a way to motivate the sellers to use such a protocol, because they get a lower rate, hopefully. MasterCard promised this many times. I'm not controlling the rates, but we have their promise.

Also [there is] the issue of converting to 3-KP because they will save some money, so we have this incentive mechanism to gradually migrate into the right solution, which I think this is really the philosophy that we are taking — to think about the marketplace and think about people, and show a smooth migration [path] between what exists now and where we're trying to get to.

Okay, so that's the 3-KP stuff, and that option extends right at this space in different ways, so it's essentially the payment [inaudible] and other stuff like some sophisticated things and some limitations that were not there. So it's really an extension of it, and it's an agreement between all of these companies.

In fact, now we should add resale and open market to this list. If we have [inaudible], we will do it. And we're going to submit it to guys here in [inaudible] format, and this is a big document. We should develop it, of course, on the network but it is not in that specific format that you're asking for, so we have to format it and so on. And we are editing a new version now, so when we're done editing we'll do the formatting, and send it.

Now, if you have been comparing separate [inaudible], how do we do this?

W: [inaudible]

Amir Herzberg: Oh sure, not that they're important but I will. Fine. SEP is Secure Electronic Payment protocol, I-KP is either I for one to three, and K protocol is — you can call it Internet Key Payment. And STT is Secure Transaction Technology. Okay?

So now let's compare them, and this is, of course, my very personal and slightly biased view, because I always look favoritively at the things I'm doing, so you should understand that. So the two protocols are really very similar: they are similar in their goals; they're similar in their approach; they're similar in everything. And the differences that do exist — and they are important, the differences — are, I believe, due to the design forces. STT was really a very, very slow design force. When I sent I-KP to Microsoft — they asked for it not more than half a year ago, and we sent it to them — we also said, "Well, why don't you send to us your stuff and we can start to compare?" [And they said], "Well, not yet." And we got it a few weeks ago, you know.

And in I-KP and SEP it was a very open process; we sent it everywhere, I wasted all of my time presenting it all over the globe, here and everywhere, and that, I think, caused some of the differences. So I think SEP used standards more than STT. For example, they sent us one, [X500], [Federal Nine certificate] and so on, and other standards.

[Tape change]

Amir Herzberg: ...most of your design, it was certainly much more widely reviewed and is reviewed, especially the I-KP part of it. We have some concerns about STT. I'm not going to bad-mouth STT, but we are trying to — actually, I'm surprised we didn't do it yet — I'm trying to get a meeting with and discuss this with the STT folks. Nothing as dramatic [as something] that could not be fixed, of course; everything could be fixed by minor changes to the protocol, like for example the minor changes of adopting SEP. They are very similar.

SEP is much more efficient, at least more efficient. Now, [with] efficiency I can't buy the cryptographic public [inaudible], they have public [inaudible] like decryption, and we have four of these compared to ten in STT, according to my count, which is about 2 1/2 times [the amount in SEP]. There is the licensing thing; STT requires licensing, certainly of RC4 which is a proprietary technology used in STT.

And we hear contradicting stories about whether licensing for Microsoft is required or not, and I really cannot say for sure that it is required. We never figured out that thing, but it may be required. We asked and got different replies on different occasions. And SEP does support the Web and e-mail, and STT is not able to e-mail, and there are differences of implementation.

So, to be very short, they are similar, and the differences are a closed versus an open approach. In the use of standards and interoperability, we work [with] all these vendors together so we really can make sure that there is interoperability. We have all the small details; this is very important, and that is something that has been shown in the Internet community many, many times. If you want a really useful interoperable standard you must have several vendors implementing it. In fact, you can't get a real Internet standard until you do have multiple vendors implementing. So it's a well-known lesson from the Internet.

[Now I want to talk about] efficiency and security, and the scope. So what are the steps that are included into the basic protocol? It includes [inaudible] on the certificate issue and in management, and implementation details over both Web and e-mail. This is how you interface to the financial networks, and there's quite a detailed error-handling and disaster recovery discussion. I'm not saying this is completely done and completely perfect and so on; quite on the contrary, this is still ongoing work. We are welcoming comments and criticism and so on, and there's an open mailing list to discuss these things.

The general overview of the system is probably something that most people cannot see. Okay, so we have the cardholder and the merchant which [does] the payment, and we talked to the acquirer, and on this cloud over here is a certification scheme that gets certificates to the different parties. I think most of you can see this, so you could make better of your time and questions.

Now, unfortunately you will not be able to read this [inaudible] also, and also I didn't even plan to present it. What happens is that I lost the high level of the presentation, but with this you can see the general flavor of the protocol. There are five messages in the interactive case of the protocol, followed by those that would be used in a non-interactive mode, which is fewer messages if interaction is for some reason not [possible].

And you see all these pieces of the protocol. Maybe I should give one example of the efficiency sayings in the protocol. People often wonder, how come STT is less efficient? Is Microsoft dumb or something? They are not dumb; I don't think that at all, and I highly respect these guys. Actually, we have many friends in their cryptographic group, so I would never want to give this impression. I respect them, but there are differences in the design of the protocol. It's not that the functionality is essentially the same, but there are differences in the [inaudible] of the protocol, and they are really the result of, I think, more tuning up that we have done — that's all, just more tuning up. So we've taken out some encryption of signature impression that were not needed, and all that could be replaced.

As an example, there is the signature by the merchant, the merchant in a sense wanting to sign, or to authenticate, two things. One is the initial offer that he's giving to the cardholder or is giving to the credit card system, because you want to be able to know that this really came from the merchant. So this is one authentication that you want. But then there's another one, where he wants to be able to authenticate that he got the payment, so essentially you want a receipt.

These are two different authentications, and it seems that you need two different signatures. But actually there's one long and old cryptographic trick in which you can say, "Okay, since I know in advance that they may want an additional signature, I can do it in only one signature operation." And the way is — do we see it here? So the way is that in the first signature you include also a positive, which is the hashing of a random number. And then when you want to change it into the second signature, when you want to give it another meaning, you just open the puzzle. So when you have a signature which stands for a specific puzzle and ends in an answer to this puzzle which only the merchant can give you, that means that you have a receipt. Without doing another cryptographic operation we got a receipt as well as a signature on the order.

So it's just a small cryptographic trick; not something very innovative, just a well-known trick. This whole protocol is not a traditional advance of cryptography work that we're doing; it's a very established cryptography that we're doing here, a very well-known thing that we could save a bit.

So that's what we try to do, we try to optimize because this will be [inaudible] many times, and I actually have it here. Well, I want to be able to do something with this scene; it's a competitor pull-up so I won't take it out, but this product, because it's a competitor's product — it's very weak, very weak computationally, and it takes a lot of time. So I really want to be able to minimize the time that it takes to do this shopping.

Okay, I want to leave some time for questions and you don't have too much time, so I will skip some of the more advanced things. If the questions will be there then we'll get to them.

So, just as a conclusion, I hope there will be convergence. I think that now the market should really focus on these two protocols, and it's not because I'm in one of these two

protocols. I think, realistically speaking, it's because I want convergence. That's why we began all these things. It's not cryptographically challenging work at all; it's simple work which traditionally we would not do even in my group, but we just wanted to have this convergence because it's important we're doing it, because we want convergence. Therefore I think we should focus on these two, and in fact we should put pressure on all involved to get convergence between these two themselves. [There's] no good reason why not.

There are some advantages, I believe, to SEP, which I say in spite of the fact that I'm involved in it. It's open, it's free, it is a broader scope and it has efficiency and security advantages. We are going to try to push these two to the ITF, the Internet standard body, to get open commerce and to try to converge into a standard. And for more information you could look at the MasterCard pages, where you can actually get all the specifications from these first [inaudible]. And these are two mailing lists. The first one is really for the discussion of that particular protocol, and the second one is what we're trying to establish with the ITF standardization forces in this area. I hope that it will be established soon as a working group, and then we'll start discussing this idea of a standard.

Okay, so thank you. Any questions?

M: STT and SEP, do they implement the new algorithm, or are they using RSA or what?

Amir Herzberg: They use RSA. If you mean public key, I wouldn't use RSA.

M: Another question regarding the newer channels you were talking about. Are they under discussion? And you were comparing them to [inaudible]. And do the applications we use need to have something done to them similar to peripheralizing?

Amir Herzberg: Okay, very good question. They don't necessarily need a key server. First of all, let's answer the second part. You don't need to do any change of application, so that's very simple. No, part of the idea is that you do it in [inaudible] and you don't have to change any applications. In fact, it is not necessarily even workstation software if you do it parallel to parallel. Okay, that's easy.

The other part about the question was, do you need a key distribution mechanism like [inaudible]? That depends. First of all, in the existing draft and the existing implementation we don't yet have the public key, so you need either to manually configure the public key to the endpoint, which is possible, and actually in many cases it's completely reasonable to do that.

If you think really about implementations in reality, then I think in many cases it's completely doable and reasonable, and for security we will actually change this key all the time, so it's not a security problem. The other thing you could do is actually use something — if you don't go to use the public key then you could use something like [inaudible], but just between these two things. So you could use [inaudible] or whatever is your key distribution, your favorite key distribution mechanism.

M: Are there any third-party encryption software packages available today? Something that you can buy and utilize to be in your application?

Amir Herzberg: I didn't completely understand what you mean.

M: If you want to buy an encryption software package, a utility so to speak...

Amir Herzberg: To encrypt what?

M: You encrypt whatever data you are transferring across the Web.

Amir Herzberg: Transferring in what way? If it is e-mail, then definitely there are packages. So you have to be very specific you know, [for me] to answer. There are packages that do some sort of encryption, definitely. In fact, as I said, there are even packages that do IP layer encryption in the market. But except for ours I'm not aware of any which is doing it in the standard way; that's the only difference which we are focusing on. Okay, there are, definitely, there are. Any more questions?

M: How specific is it to IP? If IP were to be replaced, and some other standard...

Amir Herzberg: It's not specific at all. I mean, there are some [inaudible] with the key management and most of the [inaudible], of course, are not specific. Some of the specific encapsulations are related to the fact that you encapsulate IP, but essentially there is very little signature-specific to this role. The key management definitely could be used in a completely different setting.

M: [inaudible]

Amir Herzberg: Well, when you do encapsulation you put it outside an IP header, so in the encapsulation there are some small differences relative to the fact that you encapsulate IP, definitely. You take the [inaudible] all kind of these things, but in most of the stuff it is independent.

M: Have you looked into using bar encryption in order to avoid export restriction?

Amir Herzberg: That does not help me, not at all. The only thing that would — you see, to avoid export, customers outside the United States should be able to buy the same product with the same encryption which somebody developed outside the United States. Unfortunately we cannot do this, not even by our subsidiaries outside the United States, because it has to be a company not owned by an American company. So while this is an excellent business opportunity, we have to miss it because of the existing export regulations. But other companies abroad can do it; they don't need a different encryption, they can implant the same encryption with no problem. Yes?

M: [inaudible]

Amir Herzberg: Absolutely, that's what I'm saying. I completely agree with you. In fact, that's what we believe and hope will happen, because we want to have our customers be able to do this. I mean, they need this, so that's one of the reasons you go to standard [inaudible] so your customer can buy this stuff. Yes?

M: [inaudible]

Amir Herzberg: Oh, that's a very good question, I apologize, yes. Any licenses except for RSA — that's definitely true, I apologize.

I just want to emphasize one other thing. Even with our existing product we do have an exportable version, and that version would still be very useful for security because it provides

authentication as well as a lower level of encryption. Authentication in many instances is what corporations really care about. If you look at this Berkeley [inaudible] for instance, what it's really done is [inaudible] the authentication. So it's still a very useful product outside the United States.

Yes, more questions?

Bill Washburn: What was the last question?

Amir Herzberg: Oh, it was really a comment. I said there are no licensing requirements, and the question/comment was, "Don't I need to use RSA, and isn't RSA licensed technology?" And the answer is yes, it was a mistake [on my part]. We do use RSA and you do need an RSA license.

Any more questions? So I guess we are done, thank you.

INTERNET TRANSACTIONS CASE STUDIES



MODERATOR

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Senior Vice President, Internet Business Group,
Mecklermedia

SPEAKERS

Peter Henry Stair

Senior Consultant, Mycroft Information

David Sachs

Assistant Dean, Pace University

Joel Maloff

President, The Maloff Company

Tristan Louis

Publisher, iWORLD

Bill Washburn: My name is Bill Washburn, and I appreciate your being here. This is going to be an interactive session. If you haven't seen the announcement to the change from what it was slated to be in the program, it's going to be an Internet Firing Line Session that will, as much as anything, to be perfectly blunt about it, rely on your asking tough questions.

I've tried to think of one or two, but I know that I really don't have the beginning of the kinds of serious commercial, financial and technical kinds of questions that you may well have. And so this is a session with respect to the opportunity to meet with people who work on the Internet, with the Internet, with businesses, with entrepreneurs, venture capitalists, large and small companies and the like, both in the U.S. and internationally, to ask about things that may otherwise never get answered or certainly receive attention.

So I urge you to — even as we are just beginning now — I urge you to write down the questions that you have. The reason I suggest that to you even now is because you will have more questions, or your questions may well evolve from one thing to another, and it perhaps is better to have all of them in front of you as you prepare yourself to ask the first question, which ought to be about now.

But please, as soon as possible, if any of you would like to turn it in I will be available down here in the audience, or certainly if you signal I would come down and get them, and then we won't know who you are.

Peter Henry Stair: When do you want us to introduce ourselves?

Bill Washburn: I'm going to get there right, just one second. I'm just trying to prepare the audience. You're prepared. The audience is unprepared in my estimation because I'm calling on you to really be participating.

Joel Maloff: It's an assumption that we're prepared.

David Sachs: Yeah.

Joel Maloff: We're aggressive.

Bill Washburn: That's a bad sign, isn't it? So before I allow... Is there a question? Two questions.

Yes, you in the back. No?

M: As soon as you're ready.

Bill Washburn: Okay. I'm ready.

M: Okay. In the general sense, which is more important, a [inaudible]?

Bill Washburn: Could we make a note of that question? Because I will take that question, but I would like to get the panelists introduced. Okay. Did you have a question before I get the panelists introduced? I would be happy to try and answer that.

W: It can wait.

Bill Washburn: Okay.

Joel Maloff: I have a feeling this is going to be an aggressive audience.

David Sachs: Yeah.

Bill Washburn: Good. Let's give you some red meat here, and we'll work on the rest later. I would like to introduce the three panelists that are acknowledged in the notice and also acknowledge, in particular, the president — well, not yet president — Tristan Louis, who was just recently promoted, in case you didn't get the first [inaudible] to be responsible for iWORLD at Mecklermedia. And rather than explain anything else about that, I will just say that he can say at most two minutes worth of things about Internet World origins of his and so on and so forth. I would like to ask each of the panelists to say hello to you and to give you further encouragement to ask questions and to be participatory.

So, ladies and gentlemen, we'll start with Pete Henry Stair, as listed, then David Sachs, then Joel Maloff and then Tristan Louis. And we'll go into questions within eight minutes.

By the way, one last thing; we'd like to do this in an hour so that you would have some time, so if you want to come and ask questions more informally and perhaps privately — I don't know why you would want to ask private questions, but I'm sure there might be a few reasons that you can think of, and also in case you want to get into the exhibit hall one last moment.

So Pete.

Peter Henry Stair: Bill, thank you very much. My name is Henry Stair. You can call me Pete. Please don't call me Hank. And please call me for lunch. I work for a company called Mycroft Information Internet Consultants and Telecommunication Consultants, and like [Durgan Park] I've probably been in business since before most of you were born.

David Sachs: Hi, I'm David Sachs. I teach at Pace University in New York. I write about the Internet a lot and teach about it a lot, and I'm happy to be here.

Joel Maloff: Hello, my name is Joel Maloff. I am a Internet consultant, primarily for businesses. I've been involved in the Internet for about ten years as executive director of the Big Ten University's Research Network, as Vice President of Sales and Marketing for ANS — Advanced Network and Services — and for the past two years as an independent consultant working directly with businesses to try to help them understand how to use the Internet as a business

tool, to reduce expense, to increase revenue and to benefit their bottom line.

I have a book called *Net.Profits* that's just come out. And I do work all over the world with corporations ranging from the Toro Company, Metropolitan Life Insurance, Nationwide Life Insurance, CompuServe, MCI, IBM and so forth. So I'll be happy to answer any of your questions that you may have.

Tristan Louis: Hi, I'm Tristan Louis, publisher of iWORLD. For those of you who are not familiar with iWORLD, it's Mecklermedia's Web site, which has been totally redesigned, and you can see the new look over there on your screen. Before that, I have been jumping around a lot. Even though I'm probably the youngest panelist here, I've been in the Internet for about eight years, and was really one of the pioneers on the Web since I was one of the people instrumental to setting out the Sun site at UNC, which for those of you who are familiar with the Web was one of the first fifty Web sites.

Bill Washburn: Say the long name of UNC.

Tristan Louis: UNC is the University of North Carolina at Chapel Hill, and for those of you who are not familiar with it one of the hot centers for Web development.

Bill Washburn: Okay.

Joel Maloff: Actually, I want to add that he does not have a North Carolina accent. He also doesn't fit the rest of us and he's not part of the "Internet Bearded Guys Society."

Bill Washburn: Okay. The question that was asked already, "Which is more important, time to market or..."

Joel Maloff: Functionality.

Bill Washburn: Functionality.

Peter Henry Stair: Let me assume we're talking about a service, or product or program, and the question then is are you willing to take the risk of crash and burn early on and become a footnote to history by having clear functionality or insufficient functionality just to get it out there, or are you better off to be the second or third entry into the market? It depends a lot on who your competitors are, the speed of their response and how far ahead you are or far behind you are.

Joel Maloff: I would also add that I think it's critical that any time you move into a business — and that's what it is — you consider these as nothing more than business tools. It's important to identify who your competitors are, what customers are looking for, what the product needs to do, what the price performance is going to be. All of those issues need to be considered up front.

I agree with what Pete said — if you have a product that doesn't meet the needs of the market, but it's there, it's not going to sell. If you open up a Web site and nobody knows it's there, it's not going to sell. You simply need to consider this as part of the normal business process. You need to do a business case analysis. You do not need to do paralysis by analysis, but you really do need to know where you are going. There's an old saying: "If you don't know where you're going, any road will take you there."

David Sachs: Yeah, I would also add to that. What you're watching is companies that are doing a layered approach, if you will, because it's probably a good way of hedging bets. Fidelity is a good example of that. At the moment there are no transactions that can be completed using that particular network, but it's there as a way of providing information. So maybe you can come back and look at your own question and say: "If we were going to roll this out over a year, where is my 100% of what I want, and is there a way to incrementally do some of what I'm heading towards in a well-designed way?"

So maybe instead of a black or white fallacy that asks, "does it have to be time to market versus functionality," maybe a different answer says, "maybe there's three or four, if you will, target points that I can head towards, and maybe I can do a good job of each one of them, but I don't have to do all of them tomorrow."

And in fact, what you're watching is a fair number of companies that are saying: "I'm not sure just yet what I want to do, or more importantly why I want to do it, but I want to be there doing something well." So therefore you pick minimal risks, minimal costs in terms of time and technology and all the rest of it. You do it well, it's there and then you come back and start to say: "Okay, now what do I know, and where do I want to go next with that?"

Tristan Louis: I'm going to take the radical approach here by saying that they are not mutually exclusive. Most of the twenty-something generation — my generation — is very impatient, and it fits very well in the Internet model. As a result you can bring the product to market very quickly and still make it very functional.

Now, there's only one prerogative in this — lack of sleep. The people my age, are usually — in this industry — are usually putting in 20, 22-hour days, bringing the product to market before anybody else, and then the big companies turn around and look at us and go: "Wait a minute. Why did you come up with this?"

"Well, we've been working for the past three months on a product, but we probably put as much time into this product as you would over the course of a year or two."

Peter Henry Stair: Us old guys work a lot of hours, too.

Bill Washburn: This could be bragging and complaining here, I think. First here, and then...

M: I have an open-ended question.

Bill Washburn: Could you stand up and speak so the whole audience could hear as well?

Joel Maloff: Bill, maybe you could have him hold the mic.

Bill Washburn: I don't know if it will reach.

Joel Maloff: Yeah, we've got a long cord right here.

M: This is an open-ended question regarding what I thought we were here for, commerce business-to-business transactions. What are the critical factors to success? Who's going to be able to carve out either a large market share or a niche, whether it's Open World or any of the other players? Just some of your thoughts, both from the short term — six months to a year — and the medium term.

Joel Maloff: Are you referring to the Internet services like Netscape or Open Market or otherwise, or are you talking about the end-users?

M: I'm talking about who's going to be able to facilitate business-to-business transactions over the Internet, if it is Open World, with a bank or something like that?

Peter Henry Stair: Really, back to the original topic of secure transactions. Okay, critical factors: I suspect we can draw a parallel here with early aviation. If we get a lot of headlines about a lot of crashes and a lot of deaths and a lot of mangled corporations, we're probably going to set the Internet back. I think the flurry that was caused by that rather minor bug in *Netscape* a few weeks ago is an indication of a press — my apologies to the press who are here — ready to pounce.

Bill Washburn: [The] press aren't here, so you can say it all.

Peter Henry Stair: Right. Well, I think your first critical factor has to be the nature of it. We have to be pretty sure that our security is awfully good. Because one corporation burned, and the publicity about it, could set this whole commercial field back significantly.

Joel Maloff: What's interesting is that as I look at the development of the commercial Internet, including transactions, the total commercial Internet is only five years old. The WorldWide Web has been around less than three years, and Netscape is less than two years old.

I look at Open Market. I look at SSL. I look at all of the different projects that are underway. We're still in the very early stages of this kind of development. With the huge growth of end-users and businesses now beginning to look to use the Internet, there's an enormous amount of stimulation and money being spent on developing secure approaches and secure technologies. I think we are in a position today to be able to do — if we are willing to pay for it — secure transactions. Now, that may mean that we've got to make it iron-clad. It may mean that we have to use not only secure socket layer or SHTTP or some of the other devices, we may have to couple that with physical authentication devices like smart cards or biometric scanners. It can be done. The point is identifying the business issues involved. Who are we protecting these transactions from, how much is it worth to us to protect it? We have the ability to do it. We are getting better and better at it, and we need to keep in mind that we're still very early on in the cycle of this industry.

Tristan Louis: One of the things that worries me is people always complaining about the lack of Internet security. But what few people realize is that the Internet is actually more secure for commerce right now than the telephone is. People don't think twice before giving their credit card [number] over the telephone; yet some hacker can be standing behind your phone line with a cellular phone and pick up whatever you're saying on it. Nobody pays attention to that. Everybody's screaming: "No Internet! Commerce is not possible because there's no proper security!" I'm sorry. I don't see where the point is.

M: This week we saw Oracle go out on kind of a bold move to do some different things. Do you guys think the Oracle approach is going to work, or is there a difference? Is it kind of a tradeoff between Oracle and Netscape as far as the Web is concerned?

Peter Henry Stair: Are you familiar with the Oracle?

Joel Maloff: I'm not familiar with the Oracle. Are you familiar with it?

Tristan Louis: Somewhat.

Bill Washburn: Go, go...

Joel Maloff: Well, I'm not, so why don't you start? And then I've got a general comment.

Tristan Louis: Oracle has been making some interesting comments left and right. My main question is, when is the product coming out?

Bill Washburn: Tristan, you characterize.

Tristan Louis: Yeah, essentially what happens is that on Monday Oracle announced a bold new approach with *Websystem*, which will allow its proprietary browser to access Oracle databases. They've been talking left and right. Sybase is currently doing the same kind of development, though they don't have the same marketing pull as Oracle does. And what Oracle is doing right now, in my view, is its positioning itself. They've been spending lots of money on set-top boxes, figuring that the information superhighway would happen with your television, and now they realize that their investment in this is pretty much lost. So they are trying to make up for lost time by making a lot of announcements. The question is when is it, where is the product?

Netscape, on the other hand, already has a product on the market. And I think Netscape's approach is very different than Oracle's. Oracle wants to essentially go through and deliver content through databases. Netscape says: "Okay, fine. We'll let you do that and we'll let you hook up to our servers. We'll also provide the front end, as well as providing the operating tools." What Netscape is doing is essentially creating a link between your browser, your authoring tools and your Web server. They are covering all of the bases. What Oracle is doing, on the other hand, is just covering the back end of the system.

Joel Maloff: From my standpoint as a consultant, I want to see as many different approaches as possible. What is of concern to me is that I want to make sure that they are open approaches. As an example, if I have a client that's looking to do electronic commerce, I want them to be able to accept money in any way anybody wants to spend it, just as if I go into a restaurant, I want to make sure the restaurant takes American Express or VISA or Discover. Same thing with the new approaches that we're seeing here. I want to see open standards, and I want to give my clients as many ways as possible to make money on the Network. And so the issue of closed approaches concerns me. I don't want to see an SNA environment as was in the past, where an SNA Network doesn't talk to a DecNet Network and so forth. I want to see open systems, and that to me is the underlying beauty of what has made the Internet successful in what it is today, and I want to see that continued.

Peter Henry Stair: Let me second that, Joel, and point out that some of the things we've seen here this week — particularly in the case of CompuServe, America Online and Prodigy — have been announcements that they are moving away from, or at least in addition to their proprietary client software, moving towards also open software featuring fully open Web access. So the market is moving us in that open direction. There may be additional pushes for proprietary or closed systems; I don't think they're going to happen. Personally, I think you're going to find that they will be rolled over by the open systems.

Joel Maloff: Somehow I don't think AOL, Prodigy and CompuServe were doing it to be benevolent, either.

Tristan Louis: Correct. There is that fact. And there is also the fact that Microsoft is trying to push a more proprietary approach with *Blackbird*. I don't know how many of you are familiar with it; it's a new authoring platform. What I fear is that some time in the next six months, when *Blackbird* come out, it's going to be essentially a match between Microsoft and Netscape as to who owns the authoring platform. All of them are trying to push their own standards, saying they are open standards, when they're not really, and that is very worrisome.

Bill Washburn: Why don't we wait for another question?

[Sandra Woodruff]: I'm Sandra Woodruff from the Happy Puppy Games On-Ramp. We've kind of reached a point in our evolution where — this is probably a very specific technical question — but it's a problem for us. We have server sites in Washington, D.C., Chicago, and soon in Seattle. And unfortunately, the Internet doesn't seem to have made any arrangements, so we keep having to come up with new domain names. And I'm wondering is there a technology available, some higher level of whatever addresses so we don't have to keep coming up with new names, so that people can actually find us in one easy spot?

Bill Washburn: You mean to say new as in additional, or new as you change away from what you have?

[Sandra Woodruff]: Additional. Yeah, we're happypuppy.com and we're happypuppy.net. And we're starting to run out of combinations.

Peter Henry Stair: I'm not sure I understand the question. Are looking for a way to be able to extend or cover various machinations of that?

Joel Maloff: You're looking at, I think, at this limitation in the common domain.

[Sandra Woodruff]: Well, the problem isn't that so much as that we find that we can't do business on just one server because of the bottlenecks that keep cropping up in the East and stuff, and so we've got to open more servers, and we're probably going to be opening more across the country yet as things get busier. And it's the only way people can get through to us, because we've got a pretty good gob of business coming in now.

Peter Henry Stair: So what you're really after...

[Sandra Woodruff]: Where do we go?

Peter Henry Stair: Is there one domain that can point somehow in a load-balancing fashion in multiple servers?

[Sandra Woodruff]: Right.

Tristan Louis: From a technical point of view it is actually doable. It's not a cheap option. You're going to have to essentially create your private Internet. By that, I mean you're going to have to link from one machine to the next, and essentially create a mini-network using TCP/IP stacks

and connect each of those sites to main points on the Internet. And once you've created that private Internet you can actually redistribute your content from one site to the next from the same IP. The only problem with this is that there are some serious security holes.

Joel Maloff: [inaudible]

Tristan Louis: Joel was asking me, how does that compare to mirroring a site? Well, the advantage over a mirroring a site is that you have only one IP address instead of having several, and therefore you can point to that IP address, and when it checks into the DNS it goes to your main server, which redistributes that across your private Network.

Bill Washburn: Okay. Back there and then here.

W: [inaudible]

Joel Maloff: The question was, in the case of a small company that's looking to set up a Web site, what skill set are you looking for in a project manager?

W: Right, from a technical standpoint.

Joel Maloff: From a technical standpoint. First point on that is that this is something I get involved with a lot with clients, really all sizes. The first thing that you need to do is, from a business perspective, decide what are you trying to do with this. As a site, are you trying to use it to create image to generate leads, to close business right there on the spot? That helps you understand what kind of resources you need. You then have the ability to create a request for proposals, find outsource partners who will do that for you. Internally, you're going to need someone who has the ability to maintain your content. The outsource provider doesn't do that. The person who is going to be maintaining the content will have to have the ability, understand how to be able to FTP new information, how to be able to log into a staging server, and to update that information and work with it.

From the standpoint of some of the clients that I've worked with, that person does not have to be overly technical. They can be — call it a sophisticated corporate librarian — and work in a coordinating fashion. The outsource vendor can do much of the detail work for you.

Peter Henry Stair: Now, let me add to that if I may. The content provider also, in addition to just skills, needs to be tightly linked with the rest of your media people, artistic creative people, so that they're not off on their own. One of the risks that I see a lot of my clients getting into is they hire a very technical person. The technical person goes into a closet and does a wonderful Web job, which has absolutely no relation to the campaign of the rest of the company.

David Sachs: You wanted to clarify the question.

W: Yeah, my concern is really in evaluation of new technologies. For example, the transaction presentation that [inaudible] plays is fairly high level. Someone who's not been involved in programming, and was wondering how one could evaluate those issues without being...

David Sachs: But you have to decide where your technology is going to reside, right?

W: Right.

David Sachs: And you have to decide why you've got to do it all. Or in other words, it's the classic: "Do I build, do I buy, do I rent, do I lease?" It may be that you're looking for a superman/woman who's going to know everything that you need to know, and maybe you're working too hard. I mean, I don't know anything about the size of your business, the scope of your business or what you're doing, but I would come back to Joel's point that first says, you know: "What are your goals? What are your objectives? What's your business plan? Do you need to own all of this technology expertise internally, or can you give some of it away?"

And in the process, then, you're better prepared to focus on what you really know how to do. And maybe — because it sounds like you're trying to find one person who's going to be able to do everything — that's not realistic, either. So I think there's more questions to be asked. It's not that you might not want to have technical expertise there, but it's clearly growing in leaps and bounds, and it may be that one person is not the right answer at this point. You've got good Internet presence providers who might be able to do the technical side of it, and then your issue with them says, "Talk to me about the strengths and weaknesses of a different approach," not, "I've got to know everything and sort it all out myself and solve it all myself."

Joel Maloff: Let me add to that, too. And this is going to sound somewhat self-serving, but that's what you hire consultants for.

David Sachs: Well, that wasn't self-serving at all. What do you do for a living, Joel?

Joel Maloff: Oh, consulting.

The point is that many companies are outsourcing these kinds of skills because it's hard to find these people that understand it. And it may in the long run be a lot less expensive to bring someone in who is a good project manager, understands your business, understands what you're doing, and you bring in someone like one of us on the panel for a day or an hour or whatever it may be, and say, "Okay. This is what we've thought of. Blow holes in it. Tell us where it doesn't work. Tell us what we need to do differently." That may work a lot more effectively than trying to find that perfect person at the place that you can afford if you're a small company.

Tristan Louis: I know I'm going to get shot for this by the three consultants on this panel, but there's actually a lot of college students right now that have the knowledge that...

Joel Maloff: Yeah, but not the experience.

Tristan Louis: Maybe not the experience, but that have the knowledge of this industry and can essentially recommend certain options, and help you out in making your decision.

Peter Henry Stair: Be cautious, however. If I can counter Tristan here, be a little cautious in this area. Unless you happen to be related to them or they're slaves, they will tend to gain much experience while working for you and unless you have very, very strong employee benefits programs they may look elsewhere.

Joel Maloff: Yeah, and I think it's important to understand that, as Tristan implies, this is where the Internet has come from. It is not where it's going. You're going to a professional environment where you have people that understand business. They understand how to ask the right questions rather than coming in saying, "Cool. Neat site."

Tristan Louis: [inaudible]

Joel Maloff: No, no. You don't get a chance to rebut me on that one.

M: That's actually a nice introduction to my question. As the Internet commercializes and as Netscape introduces their own semi-standard proprietary standards, et cetera, et cetera, are organizations like IATF going to be able to keep up? Who's going to help approve standards? And even if they do approve them, is everybody else going to pay attention?

Tristan Louis: Well, my question is, are there any standards left? The WorldWide Web consortium is jumping left and right saying, "Netscape, HTML 2.0 is still the one to run, HTML 3.0 hasn't been approved. You can't use a center tag. You can't use a table tag. You can't use a background tag. Look at the use on the Web; I mean, let's get real. Netscape has taken over the market with proprietary tags, and a lot of browsers are actually including those tags within the browser to support it. I think standards at this point are pretty much dead, left in the water. The committees are essentially going to give their approval on standards, but they will be implemented long before they're approved.

Peter Henry Stair: You know, I think what we're actually seeing here is we have a new standard as we commercialize and that standard is called the market. Where is the market going? Where are we going? 24 months ago, *Mosaic* came out. *Netscape* hadn't been born yet, and now 80% of us — according to statistics — use *Netscape*. That's the standard today. I don't know what the standard will be tomorrow, but I agree with Tristan that the standards groups will become recording bodies of the movement of the market.

Joel Maloff: You know, it's interesting, we talk about Internet standards; we don't have standards, we have RFCs, and they are "request for comments." When people stop commenting, they're sort of standard. We don't have standards in the same way that [CCITT] or other standard-setting bodies do.

It's important to remember that the Internet is not a technical entity. It is a community that only works together because everybody agrees to operate in a certain way, and it is that and market forces that will drive this together. I think the IATF, to get back to the question, will continue to exist. There are needs for it. I believe that many of the spin-off groups, the security group, the end-user group, the information services groups, all have done great work, and what it does is take advantage of the fact that we are a community rather than a technical entity, and that's where a lot of the development comes out. Netscape participates in these. So do the various security vendors. And sure, there are competitive issues going on, and market forces, but the embryo, the equivalent of the research and development that goes on in Japan, in the Internet, is occurring in these task forces.

David Sachs: And could I just add one more quick comment? It's also interesting, if you spend a lot of time looking at, for example, a given browser... Pete and I just finished working on a book called *Hands on Netscape*. Now, six months ago Netscape did a certain number of things, and you could pretty much talk about the traditional, if you will, Web activities that it did. Suddenly today, Netscape still does a certain number of things, but suddenly if you wander downstairs, there's this *PowerPack 1.0* that's available. Suddenly you've got a Netscape that includes real audio. You've got a Netscape that's going to include Apple *QuickTime*. You've got a Netscape that's going to include more and more corollary products, if you will, so what are we

really using anymore?

In other words, I've got *Netscape* that does a certain number of things. Yes, there are standards. That's terrific. But by the way, if we could show a class this morning, here's an example of *Java*; who in this room was thinking about *Java* six months or a year ago? And suddenly you can't walk on the floor without [seeing it] Maybe six months ago, certainly not a year ago.

But you suddenly look at the timeline and you say: "Isn't it interesting? We're talking about a browser that does a certain array of activities, but you've suddenly got a whole potential for a whole group of other things, and in a funny way that's become a standard that others are going to have to pay attention to. Whether it's formalized or not is almost not the issue. But if the browser I've got on my machine can give me real audio, I've got sound in real-time. It can give me movies when I choose to have it. It's going to potentially let me access with *Hot Java* something beyond that. Suddenly the platform has moved. Whether or not it's certified by anybody on the planet is almost irrelevant, but the platform is there, and you've got whatever, ten million people using it. Well, that sets a certain tone that I think you have to attend to.

Tristan Louis: I want to also be somewhat more cautious.

David Sachs: But this poor gentlemen is trying to get a word in edgewise here.

M: I agree with many things the panel has said, [inaudible] at the same time. Unfortunately, it's no longer an organization of university students and professors and knowledgeable people. Now in businesses you want to make a profit, which is great. And [inaudible].

Tristan Louis: That, that...

M: A desire for open systems that Joel mentioned earlier, and the fact that you want all this stuff. That's just a hard balance.

Tristan Louis: One of the way I'm looking at this essentially is what tags have been submitted to the committee standards and are being seriously considered by the committee standards. I mean, I'm not waiting for the approval when I am thinking of designing a Page, I'm just looking at are they actually talking about it, will they eventually approve it in one way or another? And you have to be very careful in adopting those tags. While the market does dictate to some point what you're going to use, you have to also be very careful because a year ago, we hadn't heard of *Netscape*. Who knows what will be the hot browser a year from now?

Joel Maloff: My feeling is that the market is the driver. I mean, the market is the bottom-line judge.

Bill Washburn: Next question.

M: Yeah, hi. I work for a financial services institution, and right now we're trying to evaluate different micro-payment solutions, different electronic money schemes, and one of you, or maybe many of you said that consumers are willing to pay for secure solutions. In micro-payments, how do you — do you understand that?

Joel Maloff: By micro-payments, you're talking about a penny or two a transaction?

M: Right. Anywhere under \$5. People like Digicash, people like that.

Joel Maloff: There are a variety of ways that those are being addressed. Actually, when I work with my clients, if they're looking at very small payments... As an example, I was involved from the very ground up with the Discovery Channel site, and one of the areas that we were interested in is that perhaps we [might] want to charge for recipes. Someone has seen a cooking program, and they want to download the recipe, and we're going to charge a quarter, 25¢ for it. [That's] the way we've approached that. And again, we start out with business approaches rather than technical approaches.

The first business approach is essentially you have a subscription. You know, it's a dollar a month, and you can download up to four 25¢ recipes for that. And you keep essentially renewing it. It's almost like the long-distance card; you renew how much you have. Nobody is going to want to put a 25¢ cent charge on a credit card. It's ridiculous, so you're not going to do that. I know there are some technical approaches that are being considered, but for right now the ones I recommend are managerial approaches. I don't know if anyone else on the panel wants to address this.

M: The other part of that is [inaudible].

Peter Henry Stair: Let me try to tackle that. The model that Joel's presenting here, a business model, is the correct approach rather than the technical approach. It's not clear that if we look at ourselves as users, that I'm prepared to carry another form of money just yet — an e-cash of some form, whether it's in electrons of some card. It's not clear that I'm prepared to pay micro-charges. It is clear that I'm prepared to accept a certain amount of advertising. It is clear that I'm prepared to have very few subscriptions, but I'm not sure that we're going to get to a point where we're going to be able to sign somebody up for micro-charge subscriptions.

I think, again, that the market is going to have to lead us there. I'm not, at this point in time, smart enough to tell us which way we're going. As it evolves over the next year or so we may see some leaders in this area. I don't know how well e-cash is doing now that it's out, but I suspect we're going to again see what the leader will become. I don't know what that leader is.

Tristan Louis: The Copyright Clearance Center yesterday made an interesting announcement with IBM, where they're essentially going to try to attach some kind of payment identification to any piece of work that goes over the Internet. This [may be] another standard company trying to push their own thing, I'm not sure how well this is going to work.

For micro-payment to work, in my view, it will have to be included in the browser. Essentially what will happen is that you will receive a bill, much like your cable bill right now, where if you pay for a pay-per-view movie, you've got an extra charge on your pay-per-view bill. You will receive a bill from your provider, and all the payment will actually happen on the back end, where your provider will pay back those content providers.

David Sachs: It seems today the closest I've seen... I don't know how many of you are familiar with InfoSeek? Well, I mean, they've got a model that basically says I can do a search for a dime a piece, only in effect I register to do a hundred of them a month, and I register with my credit card once, and it's \$9.95. And then I do my 100 searches, and it's 10¢ for each additional. Either that — and they actually break it down even smaller than that. I think you can do it for, last time I looked, either \$2, \$5 or \$10. So clearly the unit of measurement is still somewhat bigger than a quarter.

But in effect, what they're saying is okay, if you want to commit to \$2 a month, you're going to be able to do whatever it is, ten searches. I think \$5 was like thirty or whatever. So they're clearly chipping away at it. And the other approach is probably going to be, do you get some extra bills added to your Internet service provider at the end of each month?

M: I'm a vendor. I have research reports that I do that are available on my Web site. People can download them. I've [been] thinking about the prospect of having every Internet access provider having to collect money for things that I've done, and that really is frightening to me. I want the money to come to me. Not that I'm greedy, but I do not like middlemen. And I think we need to come up with ways where the vendors are in control of the money. The more and more layers that we implement, whether they be technical, managerial or otherwise, means somebody's going to be taking a piece of my money, and I'm not interested in that.

Bill Washburn: Next question.

M: I too am a consultant, and a comment to your comment before, which is that I think consultants should be hired to tell a customer how to put the team together to build the thing. And the first thing he should do — or last thing he should do, but certainly must do — is pick the manager.

Joel Maloff: Yes.

M: Or help pick the manager, because that's the key. My question is, like the mass mailer's attempt to beat the race to the trash basket, how do I get the browsers to go to my site, and must I allow them to consummate a transaction when they're there in order to have them satisfied for having been there? Those are my two questions.

Joel Maloff: I'm not sure I understand about being satisfied.

M: Enough to come back.

Joel Maloff: Oh, okay. Got it. I understand. Couple things. First of all, let me see if I'm clear on the question. You want to know how you get people to come there, and how do you get them to stay?

Okay. From a design standpoint, it's very important to recognize that a Web site cannot be an electronic billboard. You can't scan in a brochure and just think that that's going to work. It's boring. It has to be interesting and it has to be interactive.

So the first thing that I tell people is that if you're going to create an Internet site, you need to tell people that it's there. You do that by using your existing physical media for communication. You have a newsletter. You have invoices. Make sure it's on everything. Then you identify — using the search tools — the neighborhoods in cyberspace where people are that are interested in you. The newsgroups, the list servers. You monitor them for a while, lurk a little bit. When the opportunity is right, you post a message and say: "Interesting you asked that, come visit us at www.widget.com." Invite people to come in. Once they're there, then the trick [is] to keep them there, keeping it interactive, and making sure that you have a relatively minimum amount of information on the page. I don't believe in scrolling; if I have to scroll down on the page and read more than a page of words, I ain't coming back and I'm not reading it. I like lots of clickable images but in small bites.

One final comment. As I mentioned, the Discovery Channel is one of my clients and it's

been very interesting. Discovery is obviously a media company. They are the only cable TV channel that has 100% cable penetration in households anywhere in the world. Every cable system picks up Discovery. In doing their site, they do it like their magazine. They have had to go out and find journalists to work on the content and re-train them in how to write in small bits and bites, and I don't mean that in computer terms, just small units of information, because people don't read full pages. So it's an entirely new journalistic style that is now being used in that environment, and that works. They're getting about half a million hits a day on that site. It's one of the most popular sites on the Net.

Peter Henry Stair: Let me point to a couple of other things that move away from our classical sort of print or television media. There are companies who are sponsoring, shall we say, a community benefit. They're putting something on their page that draws an audience to them. And the one I'm thinking of in particular is Maxwell Laboratories and the Los Angeles freeway speeds. I don't know of anyone in Los Angeles these days with a car who doesn't refer to that page at least twice a day. What is it? It's simply every two minutes exactly what the traffic is on every freeway in Los Angeles, in a very simple, graphical form. And every time you look at it, you get hit in the eye with a Maxwell Laboratories page. Well, lovely. One of these days, a few people may actually look a little further there. But they're sponsoring something that is of use to the community. This is the old Internet image of give back to the Net, and in the process then perhaps I can promote my company.

So there are more new models coming along than we've seen in the past, and some live or useful or fun information adds value to your page in certain ways that brings people there in the first place. Freshness, as Joel has mentioned already, brings them back. You want them to bookmark you, and you want them to come back regularly.

Tristan Louis: What I'd like to say is that essentially *USA Today* led the way to the Web. *USA Today* has proven that yes, you can do stories in one single column, with maybe one jump per section and a 500-word story, tops. And a lot of members of my generation coming out of the current journalism schools are using the *USA Today* model as far as writing is concerned, to write on the Web.

David Sachs: But I would also... I guess I have two perspectives. Certainly, one is to be attentive to numbers of words on pages. But I think that really begs a whole series of questions. I know that I go to places in my life that provide me with either valuable resources that I want or useful information that I'm looking for, or a set of tools that somehow serve a broader purpose or an answer to a question that I've got. And it seems to me that when I find that I'm less concerned at that point about did it take — I mean, with all due respect to other opinions about length of words and all the rest of it, I grew up in a generation that used to read, and we used to actually read books. And I'm convinced that when we encounter things that are of interest to us we read more than five hundred words, and I'm convinced that when we find things that we want we will spend lots of time there.

And so I think the broader question, and probably the underlying one, says "What is this site all about?" In other words, I have tools on my computer or tools on my browser that we call bookmarks or hot lists or whatever. If I want information I can quickly go to two or three places that get me that information. If I want research done, I've got places to go get it. If I've got weather information... So it seems to me before you start to talk about the length of it and how pretty it is and whether it's got the graphics and all the rest of it, is it useful? Is it valuable? Does it serve a purpose? Does it enhance my professional life? And if the answers to that are "Yes," then I'm going to go there and I don't care who provides it at that point. I'm going to go

because it serves the particular purpose I've got. If, in the process, I get to read some advertising, or if in the process I get to learn about a company that I didn't know about...

If I lived in Los Angeles I'm going to go to that L.A. Freeway Speeds Page, and it's nice that it's Maxwell Laboratories, but I was interested initially in the L.A. Freeway Speed not Maxwell Laboratories. So I think there's a different set of questions you need to think about.

Joel Maloff: A very quick comment on that. I saw a statistic a couple weeks ago that said that by the end of this year, 20% of Web sites were expected to be profitable. What does that mean? How many of them are trying to be? I think it's important to recognize that many of the sites that are out there are out there for image only. I mean, is the traffic site going to be profitable? Probably not. But again, you need to know why is it there in the first place, because if you don't know what you're trying to accomplish I assure you that you will be disappointed.

M: I have a general feel question. We've been developing Web sites for quite a while. We were one of the first fifty on the Net. The [inaudible] Community College. And now we've gone commercial, and a few of us have spun off and started businesses. We've been fighting the urge to go to Netscape pages. We've been fighting tables. We've been fighting — not fighting it actively, but resisting going on true Netscape. It's very apparent to me that going around the show floor and seeing Netscape with Live Wire, Live Wire Pro, 2.0 Frames, et cetera, and they're just eons ahead of everybody else. There's Netscape, then the rest of the crowd. And now I have talked to Prodigy, and Prodigy says that they've formed an agreement with Netscape and they'll be included with...

W: [inaudible]

M: Yeah. They'll be doing Netscape on Prodigy. So now I'm going to probably go back home and say, "Okay, let's all dive into Netscape from now on and go pure Netscape." I wanted to get your feel on that. My real question is, who's going to win this thing? You've also got Microsoft now with proprietary this and proprietary that, and "Oh, it's fantastic. You can have Word on the Internet." Wonderful. You know, you can have Blackbird on the Internet. Great. Where's the rest of it? I think from the middle we have a problem that the standards committee, the Internet IATF and RFCs were built for a community that wanted to cooperate. You don't have this any longer. Microsoft has no desire to cooperate with Netscape or else they would have built a Netscape-compatible browser, And Netscape certainly doesn't want to cooperate with Microsoft. And so I really see the whole thing kind of potentially crashing down and having fifty different browser types when you hit a site, which is going to kill Web developers like us.

So I kind of wanted to get your feel on what do you think is going to happen with, who's won? It seems to me Netscape has won. You've got the Microsoft threat that could come out. I haven't seen the world embracing the Internet Explorer, nor MSN. So I kind of wanted just to get the panel feel on who's going to win and what's going to go on? Should we go Netscape, or forget it?

Peter Henry Stair: Okay. Let me start this and then I'm sure all the rest of us may have an opinion on this.

Joel Maloff: Never.

David Sachs: No, we don't.

Peter Henry Stair: The winner, I think, is maybe not exactly the question. I'll go back to one of Joel's original comments. If I'm developing Web sites I want to make sure that whoever my constituents are — they may be my business partners, customers, whatever — I want to be able to make sure that they can see what I want them to see. If they happen to be 90% Netscape, then I'll go Netscape. If most of them are on America Online, then I want to make sure they look good on *The Other World* browser. If I want to look good to everybody, then I'll start with links. Because the people who are looking at my site may be overseas and running off 2400 baud modems, and they'll be using text [inaudible]. So it's almost a race where Netscape can claim they've won, but it isn't entirely clear what they've won. It's tough to say you're a 90% leader in a giveaway market.

David Sachs: The race isn't over, either.

M: I'd suggest we're not in a 30-yard dash.

David Sachs: Well, and I would also give you a couple of examples to look at. Bell Atlantic, I believe, has an interesting page. When you get there you're asked to make a choice. And right off the bat — and they way they say it is in wonderfully glowing, positive terms — they say: "If you have a high speed connection, then select this choice, and you'll get to see lots and lots of graphics," etc., etc. And they say: "If you would like the quickest possible response time, then select this second choice." Well, what they're really saying with the second one is that if you have a lower-speed modem or a dial-up connection, then make the second choice.

Now, I think at some point that question could just as easily be three or four questions, and we now have technology in place that will identify, before you ever answer the question, what kind of browser you showed up with. So it may be that before you get done you're going to have to use both the technology to identify that, and maybe people are going to have to make a choice.

And again, then what you say is that you've identified who your potential audience is, you've given them a chance to participate in that discussion. You know, if I [have] all kinds of time on my hands and I want to look at graphics slowly over a dial-up modem, I may choose to do that. And maybe I don't want somebody telling me which browser I have to use. Maybe I want to change every month, but I want to get to your given site and I want you to be saying to me, "Gee, we've done a survey. There are three or four browsers out there that people are using. Select a box and go from there and have a nice day."

M: Then what happens is that we'll have not four browsers, but we'll have twenty.

David Sachs: Right.

M: And Apple's browser...

David Sachs: Right.

M: [inaudible]

David Sachs: And there is clearly a change. Yeah, sure you get to a site with Adobe portable document format and all of a sudden you go to the *New York Times* — that's a real good example of finessing the whole browser issue — and it says: "But, by the way..."

It also makes it so easy for me. The first time I got there I downloaded Adobe Acrobat

Reader, and now I can do what I need to do there. So probably all of us are going to get watch this shootout occur, and whether it's over a hundred yard dash or a marathon is not the issue. And the question is going to be: "Do you give me the ability when I get there to do what I thought I wanted to do before I got there, or are you going to turn me away at the door because I don't have your given browser?"

I would submit that if somebody did that to me I'd leave and not come back. But if they make it easy for me to participate, like the *New York Times* did, I'm a happy camper on two scores. Now I've got new software that I didn't have before, and more importantly now I've got access to a service that I thought I wanted to get to.

M: So now you've got to load the Adobe helper, the Microsoft *Word* reader...

David Sachs: Maybe so.

M: The, you know, *Blackbird* reader...

David Sachs: Right.

M: And probably not with *Netscape 3.0*.

Tristan Louis: Yeah, *Netscape 3.0* will be about ten megs. Actually, I think your question is, who's going to win this war? In my view, the users are going to win it.

Peter Henry Stair: But who's the developer?

Tristan Louis: From a developer's point of view, you just have to make sure that you adapt to those changes. If tomorrow morning Microsoft *Explorer* comes out on top and leads 80% of the market, well, you're going to spend a few sleepless nights re-coding all your pages for Microsoft *Explorer*.

Joel Maloff: Let me sum up the opinion of the panel. Good luck.

M: Good afternoon. We're about a \$50 million company to the third quarter of this year, and I'm responsible for bringing up our Web site, which will be up about Thanksgiving. Question...

Bill Washburn: Could you clarify that, "bringing up the Web site?" Will that be the first thing you do with the Internet, or are you already doing other things?

M: That will be our primary application, although we will use electronic mail to facilitate better communications with our vendors and the like, and we'll be implementing FTP and some other services; but primarily to help people work with our company more easily and more effectively.

Question, though. Turn your attention now internally, to the company. Companies of my size and larger certainly have marketing and communications groups, and these people have long-term experience in the print medium and their whole paradigms are associated to print medium, advertising, direct mails, etc., etc. I see some real cultural conflicts arising, both structurally, in reporting structures and the like, and with power. And I'd like to have your thoughts on how to anticipate those within the company, and ensure that both the marketing and communications from the print media and the people who are focused on the on-line side of this can work together as effectively as possible.

Peter Henry Stair: Let me start this and then I'm sure Joel has some comments, as do the others. It sounds, if I can interpret from your question, as though it's a technology group within the company that's doing the Web part, and it's a classical press relations, public relations, advertising media group that's doing the normal print media. It sounds from your question as if they're two separate groups. Is that a fair interpretation?

M: Yes. I was chartered to do this because I have the background.

Peter Henry Stair: Okay.

M: [inaudible]

Peter Henry Stair: And without knowing your company [inaudible], because I can't get too deeply into this — but one of the things that we're continually counseling clients is that this is a new tool, but it's another tool. And it has to be integrated into the current campaign. It has to be integrated into the current press relations. It has to be integrated into the current advertising. It has to be on the fax forms and so on and so forth.

One of the most tragic things that can happen to a new Web site is to have someone from the outside call a company your size and say, "I'd like to talk to somebody about your Web site," and have the person answering the phone say: "What's a Web site?"

So internally as well as externally this has to become a new tool, but it has to become part of the culture. You have to integrate. And I suspect if they're higher in the power structure than you are it's going to be up to you to make sure that you integrate yourself with them, but integration is key. You must be part of the company infrastructure, and particularly the rest of the media and the campaigns. Joel?

Joel Maloff: Yeah, let me dovetail onto that. One of the roles that I tend to play... It's interesting, I had a lady come up to me in the booth yesterday. I was doing a book signing. And I explained that I act in the role as bridge between technical organizations and functional organizations within the company. She goes: "Oh, you play the role of hairnet, keeping everybody under control?" I said, "That's one thing I've never been called before."

Peter Henry Stair: From now on, it's "Hairnet Joel."

Joel Maloff: I always thought you had to have some to have a net. God, what a terrible time with what we're talking about.

The issue, as I see it, is that you need to talk not about our Web site, not about the Internet, but functional issues. And the organizations need to understand — where's the bang? Where's the value? If you're talking about traditional PR and communications companies, one of the first examples that I can cite to you that might be valuable is a distribution of press releases electronically. If they distribute their press releases today on paper, the likelihood is that they go out to various media, they sit in a pile, and they may or may not be seen. If you send them electronically, normally they are looked at. If the media people like what [they're] seeing, well, what happens is that they have the ability to simply copy from the electronically encoded media and cut it in. I send out two hundred press releases, I get coverage, and they actually spell my name right. And it's important.

That's just one example. Most of the reporters and editors that I've spoken to would prefer to have it sent to them in that way. It shortens their time. It also is much less costly than

trying to duplicate two hundred or a thousand press releases and send them out. And so my suggestion in your environment is talk about the business issues and the implications. What is the value?

One other example. If your internal corporate communications group is working with a PR agency... I've been a Vice President of Marketing. I have had ad campaigns where they've had to nail me down when I was traveling to look at copy, to review blueines. You can send me those files over the Net and I can look at them in a fraction of the time, whether I'm in Brazil, the Philippines or otherwise. It works. What I would suggest you do is talk about it as business tools, business issues, rather than a threatening technology.

David Sachs: It also seems to me... I was thinking about it as you were talking. It's a large enough company that somebody, somewhere clearly felt a need to have this happen.

M: [inaudible]

David Sachs: So one would like to believe that having asked you to do that — which clearly costs somebody time, energy, money — I found myself thinking: "So where is this?" Now that you've got it, the question is: "Okay. So what are you going to do with it?" And I do think it's a question of what's going on, what does that common boss have in terms of... I mean, maybe you all need to go do Outward Bound for a week or something and get to know each other, but there's clearly an opportunity there just to focus on the business side of things. It would be an interesting question to say: "We've got a brand new resource, how can we use it best to serve the purposes of this company?" Which, I assume, was one of the goals early on.

Tristan Louis: Now, one of the other things is [that you should] designate a driver on your staff, have somebody to talk to the marketing department, and also go to the marketing department and tell them, "Okay, please assign somebody we could have one of our team players talk to." And that will facilitate communications where you have one designated person in each of the group, essentially keeping all of the group up-to-date on what's going on.

Joel Maloff: I don't think you can tell the marketing department. I think you have to work with them.

M: Well, in my case I [inaudible]...

David Sachs: Bill, you said there was another question.

Bill Washburn: Sure, a couple more questions.

David Sachs: Many more questions.

W: Okay. Thank you. I was just wondering; we talk about how all of this is in the you know, early stages, the adolescent stages. We still don't know all of that. How long do you think it's going to take or what will it take for us to decide that this has now been mainstreamed enough that consumers accept it, and advertisers, even small advertisers — not the \$50 million companies, but the mom-and-pop tobacco store — has decided it's worthwhile to be listed on the Web or to have a Home Page on the Web, or to be a part of it? So what would it take? How would I measure that I have gotten to mainstream, and sort of what will it look like?

Tristan Louis: To a large extent I think we're getting there. Why are some of the major companies getting on the Net? Because their competitor got on the Net. And I think it's not going to be so much the audience getting onto the Net that is going to be important, but companies now just have the impression that they need to be there. A URL is now becoming as essential as a fax number, and I think we are finally reaching critical mass.

Joel Maloff: It's interesting that you mentioned mom-and-pop tobacco companies, because I happen to have a client that is a tobacco company, and in preparing a full-day training session for them I did a search on tobacco, and there is Joe's Tobacco and Cigar Store on the Net right now.

I agree with Tristan. I think we are reaching that already. I was actually taking a train from New Jersey into New York, and at one of the subway stations we stopped, and I looked out the window and I saw on an ad — a billboard — www.perfume.com. And when I start seeing URLs in New York City subway stations, I think we're reaching the level that you're talking about. We're about there. I think within another year it's going to be very well-penetrated within all levels of business and all over the world, not just in this country.

W: [inaudible]

Joel Maloff: They don't have to.

W: They're not going to have to. They'll...

Joel Maloff: You don't need anything more than a dial-up account today, and you don't even need that to be on the Web. And again, I think it's coming. It will be here. And I think well-penetrated, whatever that means, within a year.

David Sachs: We're working right now in Westchester County with the Westchester County Association. They've got about 800 member organizations, and they were asking exactly the same question. They said: "What do we do to help large and small businesses get there?" And as soon as you start to ask that...

When people wanted telephones in their offices, they didn't all go out and learn how to install telephones. They probably called the phone company and said, "This is what we need, because we have a business to run." And so what you're finding is more and more of a proliferation of these Internet presence providers. It may be that what your small business needs is a fax machine that's up and running, so that when the orders come in or when the requests come in somebody can fax them to them, period. They can still be "on the Web." They can still have a presence. They can still use it in their advertising. It just may be that they don't need to have all the technology under that one roof.

W: But isn't it...

David Sachs: But isn't that what?

W: I was going to say that isn't there going to have to be a consumer penetration deep enough that as an advertiser, I'm going to think...

David Sachs: Well...

W: You know, [inaudible].

Peter Henry Stair: Let me try this one.

W: It doesn't make sense.

Peter Henry Stair: Let me go back to your question, because I want to have some controversy here. This is the first time that I'm going to violently disagree with the rest of this panel. And I'm going to establish what is for me a criteria of criterion, whatever. Thank you.

Joel Maloff: That sounds like an illness.

Peter Henry Stair: I'm going to establish for myself a judgment into when I think it's reached critical mass. It's reached critical mass when if they took it away it would really cripple the way we do business, and it would really cripple everything else.

If we took the Web away today — we've heard a lot of people in this room, we've heard a lot of people in this conference [talk about that], but the American public and the world public in general probably wouldn't even notice. When we reach that — and we may be a year away, we may be three years away; we're probably not five years away, but we're in somewhere in that range — when that happens, if we were to lose it and that was critical, then it would be generally widely available.

M: Okay. My comment, having said that, I want to know how many of you agree with Pete.

And my last comment is if we took it away today the American public would be just fine.

Peter Henry Stair: How about a year from now? Twelve months?

M: [inaudible]

Tristan Louis: That [inaudible] this panel.

M: Not through today, people wouldn't notice it would make a difference in the American public. In other words, I disagree with Pete.

Peter Henry Stair: Why are we limiting it to the American public?

M: [inaudible]

Peter Henry Stair: Oh, no reason. But now let's try the same question with a telephone. If we took the telephone away today, would it be very bothersome to us?

David Sachs: I'd be very happy.

Peter Henry Stair: I'd be happy too, but would it bother us.

M: Joel's point, how many in the world...

Joel Maloff: See, I think that this is going to ultimately prove to be much, much more valuable to developing countries and in international commerce than it has been here in the United States.

We can take a train from Philadelphia to New York; it's no problem. But if you're out in Iceland, or if you're in Hong Kong and you want to do business elsewhere — Australia, the Philippines or otherwise — the key here is that this is a way for people to live where they want to, have the style of life, custom of life that they wish, and do business.

In my book I interviewed a fellow in St. John's, Newfoundland, who's a consultant. There are a total of 600,000 people in the whole province. There's no business for him there. But he can live there and do work because of the Net. And today, if the Net went away, I'd be out of business, and it's not because I'm an Internet consultant. The way I do business would be gone.

M: That's what I [inaudible].

Joel Maloff: And home-based businesses that are growing exponentially are being fostered. Whether it's the America Onlines, CompuServes, the Internet, if you took all of that away today, including those on-line services, people would notice.

David Sachs: I would give you just a couple of different perceptions. One is that if you look, for example, at *Business Week*, it now includes a page every week with the URLs of all the companies that are advertising there, and so you've got a page that wasn't there six months or a year ago. You look at the *Wall Street Journal*, and once a month they've now got their last-Thursday-in-the-month issue that has several large pages filled with lots of little boxes with URLs and all the rest of it.

And then there's a story that really supports what Joel was saying. We were in Australia this summer. Well, about two days before I had gone, I had read about a new piece of software that I thought was really neat, and so I quickly downloaded it and had it on my machine. It's a piece of software called *Hot Dog* that let's you do a lot of HTML quickly. I got to Australia, went upstairs to look in the room up there, and lo and behold, there are the two fellows who happen to be Australian who have created software, the software called *Hot Dog*.

Joel Maloff: And you didn't know where they were before?

David Sachs: And I had no idea where they were before I got the software. Probably, had I paid attention to the screen, I might have [known].

Tristan Louis: That's because you didn't pay the fees.

David Sachs: Well, no. It's because, it's, with — to the contrary, there were no fees to be paid until I tried it for thirty days. This part of this is the kicker for me; Pete and I went to talk to them. We said: "Oh, this is so interesting. You all are here in Australia, and how are you doing business-wise, and gee, you know, it must be complicated software, blah, blah, blah." The young man looks at us. "Wait a minute," he says. We say, "Well, how are you doing on your business?" He says, "Oh, it's neat." He says, "We found an Internet service provider in Atlanta, Georgia. It costs me thirty bucks to register with them, and for thirty dollars a month they're my site, shipping my software all over the planet."

So this guy is in the middle of nowhere in Australia and he's running a business out of Atlanta, Georgia. I never knew where I went to go get the software in the first place, and it's costing him a grand total of thirty dollars a month to be in business, and in his case he would be out of business if that service provider weren't there. He said, "Gee, if I did it in Australia, it was like a million dollars an hour, and they were going to charge me by the byte to ship the software." And we both looked at each other and we thought, "That's really an interesting

different kind of solution to some of this stuff.”

Joel Maloff: Two real quick comments. First of all, to Tristan’s comment, I didn’t know Generation X-ers cared about money. And secondly, before you get a shot back at me, there is an absolutely wonderful cartoon that’s been around for quite a while (I mentioned it in my talk the other day) with two dogs. One is sitting in front of a computer, one is on the floor and the question — and the comment is on the Internet — is that no one knows you’re a dog. They also don’t know where you’re located, how big or how small you are. And that is the wonderful beauty about this technology and community that we’ve created. And I don’t think it’s going away. I think if you unplugged it today in all of its manifestations it would be noticed, and to the detriment of emerging countries, emerging businesses and big businesses as well.

Peter Henry Stair: Joel, I agree with you, but let me point out that this is not yet critical mass.

Joel Maloff: Bill, you’ve lost control.

Peter Henry Stair: It will be critical mass when all of our mothers have Home Pages.

Tristan Louis: Well, I’m going to address Joel’s comment about money...

Joel Maloff: Bill’s trying to say something.

Tristan Louis: Two minutes. tops. Well, when we found out that there was a lot of money to be made on the Internet, I think we started to take notice, and when we found out that you guys were getting paid the big bucks we started asking for them.

Joel Maloff: Bill, did you have something?

Bill Washburn: Yes, I wanted to ask you — having made your little poll a minute ago where we all decided how complex it was [inaudible] American public or the world public today, how many months, years is it going to take before it will make a difference? One year? Two years? Three or more?

Tristan Louis: Never?

Bill Washburn: Never? Nobody.

David Sachs: I would offer an observation. In support of the sooner rather than later scenario, I was in the Middle East in January in four rather exotic countries: Bahrain, Dubai, Abu Dhabi and Qatar. The title of the talk was “The Information Superhighway in the Internet.” They did nothing more profound than put a tiny little picture of me in the paper and a paragraph, and they had no clue in life who I was. Every single city, it was standing room only. Every single city they turned people away from these presentations, and these were four parts of the world where, at least in January, there was no Internet activity to be had. But they were hungry to know more about it, they were eager to figure out ways to use it. They were actively thinking about business opportunities once it existed.

And as of the first of August, when I went back there in late July, there is now Internet activity in that part of the Middle East. So I would submit that sooner than we think there is clearly going to be a proliferation of these services, and then I think you’re going to see Pete’s

scenario that says: "Take it away and you're going to cause a lot of harm in the process. Take it away and you're going to quickly put a lot of people out of business."

Tristan Louis: I just want to address the fact that there's also a lot of danger in getting too acquainted with the Internet. For example, there are a lot of people for whom I only know their e-mail address. My e-mail station goes down and I'm essentially helpless. I'm at that point where I don't know their phone numbers, I don't know where they're located in the world, I only know how to e-mail them. The problem with that is that if we come to a total network breakdown — as happened in 1988 with the [Jim Morris] worm — it's going to take days to bring it back up. And if the Internet is to become mainstream we're going to have to make sure that there is more communication using the telephone and the fax machines than using the Internet.

M: I just wanted to tie together three threads that I heard you guys talking about before, and then sort of ask for comments. One is that I came out of the hacker [environment], Tristan, and I'm probably about your age. However, when we start talking about commercial acceptance, I wouldn't want someone up at 4:00 in the morning writing the code that generates my P&Ls. And that ties into another theme Joel was talking about, about how you want to own the transaction, and that a lot of certain commerce solutions and other people want to own the transaction. If you're in the retailing business, or a lot of other businesses, you know that if you want to really make money you have to own your transaction. And to tie that in with the other tool theme that you were saying, it's just another tool to use.

There's a lot of other tools, technological tools available to organizations, like automated accounting systems for finance, and EDI to manage inventory with suppliers. I was wondering if either [of you] had the best practical examples of organizations that are tying the Web in as a tool for large applications, or vendors that are trying to solve those sorts of problems. The Web can spit out these ASCII tables, but how do I get those in and out of my accounting system and to my suppliers and things like that?

Joel Maloff: Let me start out with that. A couple things. When I start with a client, the first thing I tell them is forget about the Web. Forget about the Internet. Let's talk about what you want to accomplish. What do you need to do? And then let's look at all of the alternatives, whether it's Internet or EDI using point-to-point leased lines, or dial-up services or framed relay. Let's see what you want to accomplish. Then, when we determine what they're trying to accomplish, as in the case with EDI — EDI can be handled over the Internet as a transport medium using [Primrose] or Sterling Software capabilities or any of the others. Again, it's... I mean, I don't want to repeat myself. It's a tool. Which one works? Which one doesn't?

M: I'm looking not so much for that, but sort of the more concrete level.

Joel Maloff: Right.

M: Do you have examples of best practices and someone that's taken the Web and turned it into [inaudible] and done really well?

Joel Maloff: Yeah.

David Sachs: Yeah.

Tristan Louis: Yeah.

Peter Henry Stair: The three of them said, "Yeah." I was going to say, "No." In terms of total integration into a business process where the Web is just one more mechanic, I would have to struggle with that, other than the distribution of information. But in terms of a total corporate set of transactions I'll pass it down the line because I'm not aware of one.

Tristan Louis: I think Netscape probably did a pretty good job at it. One of the things is that we're seeing the Web also become a tool for groupware, and Netscape is going into that general direction. Lotus is trying to protect its market share on Notes, and several other companies are currently looking at the Web as also an internal thing. We're seeing more and more internal Web sites pop up in companies; Digital already has a product out. Netscape has bought out Collabra, about a month ago, I think — although in Internet days, it seems forever. And we are going to see a tighter integration of the outside Web, which is the one that will be viewable by everyone on the Internet, and the internal Web which will be available only to employees within the company. That hasn't happened much yet. But with a number of Lotus Notes users out there, I think we're going to see that pop up within the next year or two.

David Sachs: I would just say that I'm not aware of a company where every single aspect of the what they're doing is probably being handled well today, but certainly there are ones we can start to look at, really interesting and probably important things happening that are both either making somebody money or saving them an awful lot of expense. Federal Express is a perfectly good example. Their one page that lets you track instantly and effectively where your package is at any moment in time, from the moment it leaves your hands or somebody else's until it gets to its destination; that is both awesome in its simplicity and powerful in terms of its effectiveness. I read some number that said they were getting 90,000 requests a month.

Now you have to translate. If it did nothing but save 50¢ on every single one of those transactions, there's real money that's on the table. You look at something like GE Plastics, and we were showing this to a... Pete and I have been teaching a seminar here called, cleverly enough, "Seven." What is it? "Seven Habits of Successful Web Sites."

If you look at GE Plastics, they've clearly got a very tight market. I'm not personally interested in all of their extrusion processes and whatever else they're doing, but they've got fifteen or twenty thousand pages of documents that are available in a Web format. That was not true two or three, or whatever number of years ago. And suddenly: (A) it's not being distributed, (B) it's timely, (C) it's effective, (D) it works, (E) go fill in the blanks. But in other words, you can start to look at examples, and I think what you're seeing is the company's saying: "Where do I start the conversation and what do I do to effectively increase this aspect of my business?" And probably that makes the most sense, anyway, before you start to say: "Is it a universal application for everything in sight?"

Bill, what do you want?

Bill Washburn: I wanted to just be ready for the next question.

Tristan Louis: Okay. I'll just address the fact that you mentioned GE Plastics, which is an interesting example. I can't remember the name of the company — I sure remember their URL — but there is another plastic company out there which is much smaller than GE, and they've set up a site called www.polymers.com, which is information for people in the plastics industry. And they have managed to really create an international image out of that site.

Bill Washburn: Any others? Yes.

M: Thank you. Gentlemen, I'd appreciate your comments on theory that some people were discussing recently with me regarding Web sites that are commercial endeavors, where they are making money. Not Web sites that are advertising or your mom's Home Page with her recipes, or any of the myriad like that, but the really significant content-oriented, revenue-generating sites.

It's apparent that because of the confusion on the Web it's difficult for users to find what they're looking for; one concept is that they will develop these tremendously vertical applications, where you go one place for this and everything you want is going to be there — cars and insurance and accounting, and you know, whatever — and the analogy was that it was like unto the other industries that have evolved, where once large corporations got involved and had the resources to continue to raise the benchmark, basically either buy up, adopt or shove out the cottage industry people that were beginning to develop these things. And I'd be interested in your opinions on that.

Do you think that's what's going to happen with the Web? Do you think that one, two years down the road that it's going to be essentially just big corporate control of those content sites that are actually revenue generation?

Peter Henry Stair: No, I think what we're seeing is exactly the opposite.

David Sachs: Why don't we take a vote on the panel? How many of us think yes?

Peter Henry Stair: It's the small business. It's the entrepreneur, the start-up, the very small industry that's challenging the top-heavy older industries out there. One of the examples we often use is Matshusta. Matshushta's Home Page, if you go look at it, is quite handsome. Matshusta in, I believe the *August Fortune*, was rated the largest corporation in the world. We also show them Big Wind Kites, which is a one-man kite shop in Hawaii. Big Wind Kites looks better. Now, they're not going to take Matshusta's business away from them...

M: [inaudible]

Peter Henry Stair: Well, who's Matshusta?

David Sachs: What did you mean? Are you asking how successful those sites are going to be?

M: Yeah, I'm talking about sites that are generating revenue.

Peter Henry Stair: Sure. Yeah, and what we're seeing now, I think, is that the smaller sites are actually generating revenue for the smaller entrepreneurs more quickly.

M: Right.

Peter Henry Stair: More quickly than the corporate sites, which are tending to be extensions of their public relations department.

Joel Maloff: Yes. Let me address it from two standpoints, first of all from my own personal standpoint. As I mentioned earlier, I actually sell reports. The reports are doing exceptionally well. I am a one-person company. And so, yes, I think that they will generate revenue. I'm not

going to generate the same amount of money Matshusta might generate. I'm not selling tractors. The other thing, too...

Tristan Louis: You don't do tractors?

Joel Maloff: No, I don't do tractors. The other thing that's important, is that if you look at the very large companies — I don't care how good and how agile they are — they can't move as fast as I can. I am the decision-maker. I am the cook and the bottle washer and everything else, and so I have the ability to be flexible. What this medium does is give me the ability to compete, and compete in an economical way. I have the ability to advertise in an interactive fashion and let people know that my services are available and they can avail themselves as they wish. I think that it is an empowering technology rather than a limiting one. Sure, the big guys are going to be out there, and they're going to do lots of good. But the smaller ones, you know, the little gnats, are always going to be much more agile and much more effective.

David Sachs: And if you think about it, what you've really got is something that has lowered the barriers to entry and lowered the... In other words, if you're going to compete in a global economy, if you were going to do that ten years ago you probably needed to think about the cost of getting your items around the world, the cost of that. How does one effectively live in the wilds of Michigan, for example — I just made that up — and let somebody know in the Philippines that their services might be both useful and accessible?

You can't hire an advertising company halfway around the world to work on your behalf on the offshoot that maybe you'll get some business out of it. But suddenly you've got a barrier to entry that's remarkably low.

And so, in an interesting way, I really think it's moving in exactly the opposite direction. I think you're going to have big companies, or maybe conglomerates... You had an announcement, whatever it was, this week, late last week, about all these insurance companies. You're going to be able to, in effect, do one-stop shopping to go do that. That's wonderful, but that's probably going to not change the dynamics of other people who want to do what they're doing. It just says that's another opportunity and maybe it's going to be in a different way. But I really think the barrier to entry has gotten lower and lower. The cost of the hardware, the cost of the software is getting dramatically lower day by day. That suddenly changes the whole dynamics of this and, if anything, gives all of us more opportunities than we ever had before.

Tristan Louis: One of the interesting things that is happening is essentially the switch from the publisher controlling everything, and the producer, the big Time Warner and CNN controlling everything, to essentially those folks being marketers. You're going to go to them with your product and they are going to market your product. On the other hand, you can also go at it your own way and market your product. You might not be quite as successful. Hopefully, we will be able to do that.

Bill Washburn: It seems to me there's a variation on this question I'd like to at least put before the panel very briefly, and that is that potentially there could be a symbiosis developing whereby the very successful content providers — who are small and generating revenues become the immediate targets of purchase for larger corporations — that they themselves are perhaps incapable or not interested in doing things as well. At that point, if that becomes a symbiosis, where does that leave the rest of the Internet community in terms of what the benefits are to them, or is it just simply not an issue?

Tristan Louis: To a very large extent it's already happening when you've got America Online buying *Global Network Navigator* from O'Reilly for what was it, \$10 million I think, and then repackaging it as a service. And then you've got Dennison turning around and buying *Lycos* for an undisclosed amount. We are at that point where big companies are trying to buy an edge into the market, and that is going to at some point drive the price of Web sites up if you are an independent creator.

Actually, last week as I was surfing (one of the few things that I was able to do last week), I stumbled on the first page that said: "Corporations please take notice. This site is up for sale." We're going to see more and more of that come around. You can walk around this floor, and if you've managed to make a name for yourself on the Web, you have VPs crawling all over you, asking you how much money do they need to throw at you, how much money they need to throw at you for you to go your own way and set up your Web site.

Bill Washburn: Last question.

M: A year ago or two years ago, you gentlemen were probably saying that the opportunity was for Internet service providers, that that was going to be an entrepreneurial opportunity. That window is probably closing because there are a lot of them out there. The next logical phase for entrepreneurship might be to provide third-party services to support those Internet service providers. I'd be interested in your views on that and what you think those opportunities are.

Peter Henry Stair: The "hot set." I'll start here. The "hot set" at the moment appears — not only from the interest of this audience, but the interest here on the floor — of what we would call Internet "Presence Providers." Joel mentioned outsourcing a few moments ago. There are a lot of people who want to be on the Web but really don't want to do it themselves, and so the hot opportunity at the moment seems to be able to do the design, do the support, do the presence, if you will, on this WorldWide Web. That seems to be one hot opportunity.

Another is the software entrepreneur. There's so many new pieces of software out there; some will survive, some will die. But the ones who survive have tremendously powerful opportunities. And without complaining about Generation X and their money, most of them are very young. Most of the software developers in that field are very, very young. So those are two, I think, very hot opportunities at the moment. I agree with you that the service provider field has become pretty much a commodity.

Joel Maloff: I have two comments. First of all, I agree partly with Pete's last comment that the Internet access provider marketplace window is fairly well-closed now, except for geographic niches or vertical industry niches in the United States. It is absolutely not closed elsewhere in the world, except for perhaps a few places in Asia like Japan, perhaps Canada, maybe England. Everywhere else it's wide open. And then in terms where I believe the hot areas are, if you listen to most of us talk you'll hear us still talking about technology.

I think the time has passed for technology. Let's talk about applications. I want to see businesses that are incorporating Internet as part of a value-added service — language interpretation and translation services where I can send a proposal. Let's say I'm doing work in Dubai; Pete and David mentioned Dubai. I don't speak or write Arabic. I send them my proposal in *Microsoft Word*, across the Net, and they interpret it so that it is correct and accurate in that language. I can submit it in that language. That's a good one.

There are other ones — companies that do domestic surveillance, and maybe we don't like those. But let's think about the specific business applications and that's where the bang is going to be in the next wave. What do I do with it now, beyond how do I do IP? How do I do

Web hosting? Those are all good. But let's look at the next wave.

Tristan Louis: I'm going to break from the panel by saying that I think the Internet access communities still have a lot to offer. What they need to realize, however, is that their job is not just one of connectivity but one of creating a community within their own connection area.

For example, in my ample time I am running an ISP in the New York area and one of the things that we've started is we... While we were adding phone lines, we decided to have some people come in and also help us out. And from there, those people started talking about Internet issues, globe Web sites, etc. We turned it into a gathering, a weekly gathering, and as a result users are re-signing with us year-in, year-out, and more people are coming in year-in, year-out, because of that community, because they know that when they connect to our site they're not just going to get Internet connectivity they're also going to meet new people and be able to share that Internet experience with them.

David Sachs: I would just add one other comment, and part of it is clearly a function of what I do for a living. I think the opportunity for education is enormous. I mean, even if the numbers reported in this week's survey are accurate, which says somewhere in the U.S. and Canada you've got 24 million people using this resource, that implies a huge number that is nowhere close to using this resource. I was at a dinner luncheon last week in New York with lots of successful executives from lots of different businesses, and I was sitting at a table with somebody who was going on and on and on about — I mean, he had invited me to the luncheon — he was talking about the Internet like this was the best thing since sliced bread. Finally, one of these guys interrupted me. He said, "You know, with all due respect," he said, "I don't even know what you're talking about." He said, "I know what the word is. I see it in the paper." He said, "I couldn't tell you what it is, what it does, why I would care about it, how it's going to help my business?"

And so, in an interesting way, I think we've got an enormous amount that is happening, but I think the potential is still — it's not like all the gold has been discovered in California or wherever. It's that you've got a fair number of people who are aware of this, but I think the opportunity... I mean, I look at the books that are out there today. You've got books all over the place, and you know, why is Joel writing a book, why are we writing books? Part of it is because it's not intuitively obvious. People are still trying to learn this thing is. How do I integrate it into my life? How do I get the tools that are, remarkably, getting better and better? I still have that learning curve that says: "Well, how does that become an easy process for me to do?"

So I would add a different perspective that says, forgetting about Internet and service and access and all the rest of it, I think you've got a huge number of people out there who need to know a lot more, and want to learn a lot more, who need help and support in the process of doing that. You've still got sites that dabble in technical gibberish, like IP addresses and dynamic and blah, blah. I mean, you get into a whole world that many people never wanted to be in in the first place. So I think there's another whole sort of interface in there, that human side of things that teaches people how to use things on their own terms.

Bill Washburn: Ladies and gentlemen, thank you very much for your questions and your comments, and I hope you have enjoyed the conference.

INTERNET VILLAGE WEBABLE! THE WEB'S 'FIRST-STOP-SHOP' FOR PEOPLE WITH DISABILITIES



MODERATOR

Laverna Saunders

Dean of the Library and Instructional & Learning Support, Salem State College

SPEAKER

Michael Paciello

Program Manager, Vision-Impaired Info Services, Digital Equipment Corporation

Laverna Saunders: I'd like to welcome you this morning to Internet World. This Track is [the] Internet Village, and you are in the Waterfront Ballroom. If this isn't where you want to be, this is a good time to move on to the session where you think you should be, whatever that means.

Our first presentation this morning will be by Michael Paciello. The WorldWide Web has been painted as an information superhighway that will lead us all to the promised land; and for many people it will, but not necessarily for the people with disabilities. The Web can truly be a tangled mess woven by entrepreneurs who have no idea that millions are being left in the air. Does anyone really care? What are the so-called barriers that the blind, deaf and physically-challenged must break down in order to access the Web? Are there really any solutions at all?

Michael Paciello, Senior Usability Engineer and Program Manager for Digital Equipment Corporation, Vision-Impaired Information Services Program Office, has been a consultant in the field of assisted technology for people with disabilities since 1984. He was recently elected as chair to the Electronic Industries Association, Assistive Devices Division, and is on the Board of Directors. He is co-founder of the International Committee for Accessible Document Design, the organization responsible for the accessibility codes developed and included in both HTML and SGML standards.

If you want to hear more from Mike, you can come back to Boston in December, when Mike will be chairing an international one-day workshop at the WorldWide Web Conference here and will focus on the subject of accessibility of the WorldWide Web.

His presentation today is entitled "WebABLE! The Web's 'First-Stop-Shop' for People with Disabilities." If you want to communicate with Mike after the meeting his e-mail address is mpaciello@webable.com and his URL is <http://www.webable.com>. Without further ado, I'll turn the presentation over to Mike.

Michael Paciello: Good morning. I'd like to thank you all for coming here to hear me speak this morning. I hope that those of you that are here understand and realize the importance of an endeavor that myself and many of my colleagues are trying to work on, and that is the accessibility of the national information infrastructure, which obviously includes the WorldWide Web.

Just a couple of quick notes up front. Are there any people here, any with us, who have a disability? Any that are deaf or blind that are with us? Okay. Are you deaf? Okay, how are you?

I always think it's very important before I start any presentation to determine who my audience is, and the first people I am concerned with are those who have a disability. Quite obviously, that's the business that I'm in. I am also concerned about those who may be working with or perhaps employ individuals with disabilities, so if you are one of those, raise your hand. Excellent. Very good. How many employ individuals who are blind? None. Okay.

If you are interested, before I get started, one of the companies that I've been working with is a company by the name of Berkeley Systems. You probably know them better for the

screen-saver software that they make; however, Berkeley Systems is also very well known for putting together a piece of software which is called a "screen access" or "screen reader" for individuals who are blind or have low vision, and it is compatible with the *Netscape* browser. The blind can actually use a graphical user interface browser with a Braille output display or with a voice synthesis. If you'd be interested in getting a demo of that, I have just five disks — four diskettes — that they sent me of the demos. You can see me after this particular session.

As I mentioned, I've been involved in the disabilities world for about 11 or 12 years now. I am a consultant in the field. I serve on several different committees, a couple of which we'll actually show here — we hope, with the server being somewhat problematic — a little later on. I serve on the Mosaic Access Project, which is a committee of individuals who are working out of NCSA to work on accessibility of browsers — not just the *Mosaic* browser, but browsers in general.

I also am a consulting partner to the Universal Access Project, which is part of Vice President Al Gore's NNI Initiative. We are working on developing standards and guidelines for the national information infrastructure and the global information infrastructure and, as I found out a couple of weeks ago, folks in Europe and their EII consortium have now asked us to be involved there, so we're working with them.

I'm also involved now with the folks from the W3 Consortium. They've graciously allowed us to put in, at the very last minute, a special one-day workshop at the WorldWide Web Conference that will be coming up in early December. If you'd like to find out a little bit more about that, or if you'd like to come, please see me after this particular session.

This particular session, as you well know, is entitled WebABLE. I want to say up front that it's not meant to be something where I'm tooting my own horn, because this happens to be a site that I've put together and have developed. Rather, it is to serve exactly as what I wanted it to do when I developed it; it's to be an information repository, a place for individuals who either have a disability, employ people with disabilities, or somehow have an interaction with individuals with disabilities, so that they would always have a source place to go, a first-stop-shop as it were to find out any information that they might need in relation to people with disabilities.

There is a plethora of titles and topics and issues related to that, and this site is not just focused on things related to situations going on here in the United States — the Americans With Disabilities Act, for example, or Section 508 — but rather it is also positioned as an international site, so we have sites here from all over the world, papers, conference sponsors, product and solution manufacturers who are located literally from one end of the earth to the other. That was my goal when I set this up about six months ago.

I'm very happy and very glad for the support that Meckler has given me in relation to being able to show and display these things. As you may know, in the October issue of *Internet World*, they actually did an article on disability sites, so you might take note of that if you haven't picked it up. I'm not sure if they're actually handing it out here, or if they're selling it, but the November issue — I'm sorry — of *Internet World*, on page 141, lists briefly a few sites that are actually located and positioned for people with disabilities. That is just one more way of their showing how they support this work, and we really appreciate that.

When I designed WebABLE I designed it as a usability engineer would — which is my other work, my part-time work, even though it's supposed to be my full-time job — so that access for everyone would be the key. That's what we've been striving for. We're looking for access for people who are blind, so we're looking up projects and focusing on things here that include, for example, voice synthesis for individuals who are blind. We'd like to make sure that individuals who use refreshable Braille displays — does anyone know what a refreshable Braille display is? One person, and I think we probably have about 30 or so here.

Refreshable Braille display; let's see, how many saw the movie *Sneakers*? All right. A few more. If you remember in the movie the individual who was blind, as he was interacting with the PC, was using a device that kind of looks like a keyboard but, in fact, on the front panel are the little dots that come up very, very quickly. That's a refreshable Braille display, and essentially what that does is it reads the ASCII streams as they're coming in and just pops them up and translates them into two lines of Braille; usually they're 80 columns and 80 character displays, two columns all the way down. So that's a refreshable Braille display, and this is an item that is very commonly used amongst the blind as they try to hop from site to site.

So it kind of gives you an idea of the challenge that they have. A graphical user interface, for example, is not intuitive in the sense of sending back ASCII streams. It's supposed to be sending pixels, it's displaying pictures, so how does one go about getting the ASCII? Well, that's one of the things that we've been working on, and WebABLE provides hits and hyperlinks to showing that.

We've also been working on one of the places we'll visit in a little while, the Trace Research Center. They're located up in Madison, Wisconsin, and the director is [Greg Vanderheiden]. Greg was here just last week. He and the folks at WGBH in Boston put on a small, half-day forum in which he gave a display of a tactile information kiosk that was also accessible to the blind, to the deaf and to those who are physically challenged in one way or another. That kiosk was totally accessible.

There wasn't an individual who could not use it. For individuals who are deaf, there were captioning cues where there were perhaps calls that would normally be generating other sound or audio cues, so every time a display came up that might have shown a movie or a video clip it also had an attached caption clip with it.

For the blind, the whole kiosk is completely tactile. There is a square, so there's a defined region for an individual to feel and run his hand along the screen. And there's voice synthesis and read-back of everything that's actually on their display, so that a blind person can actually use all of the menus, go from icon to icon, menu to menu, list to list, all the way down the line and run that kiosk completely.

For those who are physically challenged — and this is another very interesting aspect of my work that helps us to move into some of the next-generation devices that we've been working with — there is infrared access on these particular kiosks. So if you have an individual, for example, who is paralyzed from the neck down, a quadriplegic who has no physical means of accessing the buttons, in many cases it is also true that they're not even able to speak so that they can be understood. By using small infrared devices that are attached somewhere to them — or perhaps in some cases that we're also looking at, on wheelchairs — they can control what goes on in the screen. So that's another thing that you can find located here on WebABLE. Again, I mention close-captioning for deaf users and descriptive video for individuals who are blind.

Again, if you're not familiar with descriptive video, this is a server that was actually invented and promoted by our folks right here in Boston, at WGBH. It has become almost an industry standard now in the sense that they have learned how to take a video, motion videos, and during the pauses where there is not any dialogue or any exterior sound effects, they clip in narration so that you describe the action that's going on to the blind user.

Now, mind you, all of this is available on the WorldWide Web. That's the key here — that these things that typically are associated with being inaccessible to people with disabilities are there, and are available for being keyed on. We're looking at building or promoting the use and the building of cognitively-enhanced or easy-to-understand interfaces for those who have cognitive impairments.

Let me just briefly give you one way that I've done that on my own site here. I've created a toolbar here on the WebABLE site; and you'll notice that the toolbar actually uses blocks. Now, I did that on purpose because blocks are, generally speaking, one of the first foundation stones that are used in teaching young people, so individuals who have cognitive impairments can immediately identify with blocks. Along with those blocks we try to make them so that they can be easily identified.

You'll notice that each of the blocks has an association directly beneath it, what it actually points to. Of course, that's a menu also for the blind who can't read those graphical images; although, in fact, each of those images has a text description behind it.

The idea is to try to create simple interfaces that are laid out in an order that makes it easy for individuals with disabilities to access. There are a lot of other provisions here on WebABLE, and we do invite you to visit there in your own time. For example, there is a list — and, again, we'll touch on this in just a moment — of assistive technology manufacturers who have their own WorldWide Web sites, and you can connect to all of them from WebABLE.

In the case of assistive technology manufacturers or solution providers who do not have their own Web sites, generally speaking, most of them — I have yet to run into any who currently do not have an electronic e-mail address through CompuServe or through America Online or some of the major service providers. Those are also listed there.

We're currently working on an image map — it's kind of tricky because of the fact that we have people with disabilities who are accessing this site on a daily basis — that will, at least right now in the United States, locate and provide the address index of every technology manufacturer, every federal, state and local agency that helps individuals with disabilities and provides funding and direction. They can click on the state, click on the city and get help right away by just accessing the site. There are about 30 or 40 research centers that are located on this site. Again, those are international research centers.

All of these research centers are focused on the needs of access for people with disabilities across the board. Not all [of them are] with the Web, but many of them are involved. Trace Research Center, for example, is. The University of Toronto is and they're working on the virtual reality modeling language, and they've just received a significant grant from the Canadian government to do that. And there are several other sites throughout the world, the folks in Europe and Asia.

Of course, we provide links to service centers, consultants in the field who have their own Web sites, and mailing addresses for non-profit organizations and their services, for example with recordings for the blind and dyslexic. They have their own Web site; I'm actually working on a site right now, right here, for the National Braille Press to get them up on the Web and then they'll be accessible.

So those are the type of things that you can find on WebABLE. I'll just turn to my notes here, and if you'd like we'll take just a couple of minutes and we'll shoot over to some of the sites to give you some idea of what things are available in WebABLE. The other thing that I'm going to do this morning is give you some pointers, if you are interested, in designing accessibility into your Web site. That's like an added thing that I've kind of thrown together.

As I mentioned, there are a lot of different things on WebABLE which you can use to your advantage. One of the things that I always remind folks is to sign in at the registry because I maintain a mailing list that is accessed by hundreds of solution providers and manufacturers, and it also helps me to send out updates on what we have provided here on WebABLE and Net sites and whatnot.

As you can see over here — and I'll focus on the Web sites — the first thing I do every month is I update the news section so you get an idea of the type of things that have been added. As I mentioned here, one of the things that we're working on right now is designing this

one-day workshop which will be available or which will take place on December 11 — that is actually the date of the conference down here in Boston for the WorldWide Web. [This section of the site] provides information related to registration for that particular conference.

You'll also note that this month we've just started up a library where we're loading several documents, guidelines, White Papers and things along that line for individuals who are concerned about people with disabilities. One of the papers that I left in the back — if you haven't had a chance, please feel free to take whatever you want from the back — is called *Access Taxed*. This is a directory service of Internet sites, FTP sites, Gopher sites, WorldWide Web sites, Telnet sites and all the way down the line, sites that deal or serve the needs of people with disabilities. This is also located up on WebABLE, and you can now just download that to your own site, or to your PC or to your desk there. Then each month I add in the new sites that have been [added]; sometimes, as in this case, they're research papers, and as you'll see they're the hot job of browser papers there.

For those of us involved in disabilities, we are very concerned about the *Java* language and the browser itself and its accessibility. Last week I had the opportunity to talk with the folks from Sun and they've guaranteed me that they will now focus on accessibility to make sure that the browser and the language itself is accessible for people with disabilities. So we're trying to get ourselves into as many areas as we possibly can. Generally, I always recommend that you try to go over to the "What's New" area and that will keep you up-to-date on what happens.

The next thing that we're just getting started with is the WebABLE library. As you can see, I can't even count because this is the article on the White Papers and it's supposed to be two and it only says one. I keep a running list of how many papers we have... We're just getting started with this.

One of the things I would like to point to that is of interest is the Adobe Accessibility Plan for PDF and Acrobat users. This is, again, one of those very important issues for us in the accessibility field, and actually getting involved with them was almost a war at first.

What happened was last year when NEST — which is the federal agency that develops the standards, the federal standards — decided that they were going to redefine electronic document interchange within the federal government, they were focused on the PDF output. PDF, in and of itself, is a graphical output and is totally inaccessible to the blind and low-visioned. In one of the consortiums that I belong to that was mentioned earlier, the International Committee for Accessible Document Design, we were able to contact the folks at NEST and let them know that it was inaccessible. They have, obviously, the largest population of employees with disabilities within the federal government, and they are individuals who — in fact, one of the directors of the IRS is blind, and based on this standard, would not have been able to see [any computer files with this program].

In fact, the way that they are doing it right now, he can't even use the IRS forms that have been put on-line, the ones that his own department developed. So we got involved and, of course, this brought in some issues with Adobe; and we're just really a small consortium of about ten people who work internationally on developing standards and information standards. The good thing about that is it turned out that Adobe was willing to work on accessibility and they've actually developed a plan that they are actively working on right now — and that we are working on with them — to build accessibility viewers for individuals who are blind and low-visioned.

So this was really something that was very exciting for us because, like I said at first, there was a lot of resistance; and when Adobe actually took the time to fly us out there at their expense and meet with them to talk with them about accessibility and what things needed to be done, they were very accommodating. And we believe that things will be worked out.

These are the kind of things, again, that you'll find in the library on WebABLE. Another thing that we'll obviously provide are news briefs, new product announcements, and some of the conferences. Now, these conferences tend to be conferences related to people with disabilities. I just returned from Minneapolis about a week and a half ago for the Closing the Gap Conference, which is a very popular conference. Conference announcements and registration things are listed there for people with disabilities.

Then, of course, I have what I call some of the special features. A little reaction there. This month we have focused on putting the "Access Text" directory listing there for individuals to download.

There is an article on how to make the Web accessible for the blind and visually impaired.

I always have a site of the month that's a disability site, and this month it's Project Do It. Project Do It is based out of the University of Washington, and they just received an award for their site; this is mentioned in the article in *Internet World*. Then, as you'll also see here, I have put together or solicited surveys of one nature or another.

This particular one was one that was sponsored by the Electronic Industry Association's Assisted Devices Division. What happened was that we conducted a couple of focus groups working on trying to develop guidelines and standards for consumer electronic product design. This turned out to be very, very successful. We put up a form, made it easy for folks to sign in and register, those folks who were going to the conference and attending, and then eventually this information was sent right back to the EIA. We had two very successful focus groups; the EIA will actually be putting this out in document form on the Internet once we've gathered everything, probably by the first of December. So, again, another one of the things that is very helpful.

One of the things that I mentioned that I would also do is provide you with some of the design guidelines. If you're working on a Web site and you are considerate of the needs of individuals with disabilities — now, there isn't a rhyme or reason per se that is listed here, so don't take these necessarily as the top ten Dave Letterman hints for designing your Web site for people with disabilities. That's not the point. These are just important ones, and these tend to be the ones that we find are most useful.

The first thing I tell everyone is to be sensory aware. When you're designing a site — oftentimes before I do anything I'll close my eyes, I will keep my arms to my side and I will mentally tune out any sounds so that as I'm designing each page I'm cognizant of the needs of individuals with disabilities. That's usually the very first thing we try to do.

This whole presentation is basically positioned as an awareness presentation, so be sensory aware. Try to find out, try to determine what the needs of individuals with disabilities are. I can tell you right now you will never be able to design a site that is fully and completely accessible to every person with a disability; it is literally impossible. However, you can reach a great percentage of those individuals, and when you accommodate them it makes it very easy.

I will also tell you that there is a very, very high rate of individuals with disabilities who are Internet-savvy. They live on the national information superhighway. These individuals very often can't find employment, not because they can't work, but because people won't employ them.

In some cases it is because they can't get to a place or physical location; oftentimes they run businesses out of their homes, and having electronic connections is extremely critical to their lives and to their business. So they're there and they're using it and they've been out on the Internet for years and years and years.

W: [inaudible]

Michael Paciello: [Is there] a number for individuals with disabilities who are using the Internet? No, there isn't. I can tell you that there have been some attempts to do surveys. The American Council for the Blind is doing a survey right now to try to determine how many of their blind members are connected to the WorldWide Web and the Internet. But even then, that's only a small focus of people because that's only individuals who belong to that consortium.

[Gallaudet] is also putting together a survey to determine how many deaf users are out there on the Internet. The figure right now for the United States is that there are about 50 million individuals with disabilities; by the year 2000 that number is expected to get close to 80 million, and that's because of the obvious rise in age in the population. That's just here in the United States. I can't even guess at the number of how many people with disabilities exist in the world, but the percentage is much higher outside of the United States than it is here.

So that kind of gives you an idea. People often talk about the market for individuals with disabilities and that's the reason why they don't do things. It's there, you just have to know the numbers.

The second hint is design the server, the browsers and the authoring tools. These are the three primary things you can probably throw in the operating systems. For example, I left back there — and I notice that they were the first things that were gobbled up and I expected that — the Microsoft Guidelines for Accessibility and what they've done, particularly what's available in Windows 95.

Are there a lot of PC users here? Raise hands. Lots of them. How many know that there is an accessibility option in the Windows 95 interface? Now, there were about 15 to 20 hands that went up when I said that, but only four of you raised your hands about the accessibility option.

That module is there. It's available through the control panel and in the next month I will be starting to give seminars on exactly how to use those accessibility options. I will tell you that this happens because it's happened within my own company, Digital Equipment, how system managers before they give you your PC turn [the accessibility option] off because it's a memory hog.

Well, that's not really true at all, and the more individuals who know about the accessibility option the better, because they actually provide some very practical utilities, for example with the ability to do large-screen magnification. You don't have to necessarily be totally low-visioned or blind in order to use screen magnification; I know individuals who just have poor sight or wear eyeglasses and prefer to have screen magnification. Those are the kind of tools that are available there.

If you didn't get one of those handouts and you would like one, make sure I get your card after this session and I'll leave plenty of time after the session so that we can talk.

So we have operating systems, we have the folks who are working on the servers, the folks who are developing the browsers, and the authoring tools.

An excellent example of an authoring tool corporation who has worked extremely hard in accessibility is [Softplate] out of Toronto. They have built *Hot Metal*, which is an authoring tool for the Web, that's totally accessible to individuals with disabilities, particularly those who are blind and low-visioned.

We try to encourage that, and we're trying to partner with as many individuals — when I say "we" I'm usually talking about the circle of consultants in the field that I work with that are trying to work on exactly these issues — we try to ask individuals to include captioning for the deaf, where you have a sound clip. It's not that hard. And if you really have some savvy you can get the captioning software right from WGBH; it's very inexpensive and you can do the

captioning right there. Include description video for the blind when you have video clips. That provides narrative.

Again, that's a software package that you can pick up and put in. I've seen individuals who are using their *Sound-Blaster* and doing voice-assist and implementing description video that way.

Include text descriptions for images. Now, this tends to be one of those guidelines that is actually true just because [there are] individuals who don't have access to a GUI browser — graphical user interface browser — but use Links, for example, or perhaps use the W3 browser that was developed by Bill Perry up at Spry. They obviously can't see images with those browsers, so if you don't provide a text description of what that image is an individual is probably just going to get the broken icon up there that just says "image".

Well, that image may be important to what's on the screen. It may not seem like it's important to you, but it is certainly important to the individual who is blind or low-visioned and has no idea why that's sticking up there in the middle of the screen. So provide those text descriptions. We also — again, in line with the browsers and those who are building off-screen viewers — recommend that they provide the option of showing a particular item in a graphic text.

We mention that you should try to provide a complete listing of all URLs that are associated with an image map in a separate link. That way an individual who is blind or low-visioned who can't read or access that image map at least has a way of getting to all of the material and all of the links that are associated with the image map.

This is a critical one: don't use images for text displays. One of the popular things that's going on right now is to throw these up little images that say "new" — that's one of the popular ones.

In fact, I know four or five sites that are positioned solely for the blind who use them and never give thought to the fact that those textual images cannot be read in any way, shape or form by a person who's blind. So if you do put up one of those images, make sure that you use the "alt" parameter and add the text along with it.

Because tables have been included for support since — let me see, I think it is HTML 2.0, certainly in 3.0, and the browsers like Netscape have a support for it — we try to recommend that you provide a simple layout for tables. Now, that's a recommendation that's not always easy to do. Tables are very difficult to display, and obviously they are difficult to code in HTML.

If possible, provide them in an alternative view. For example, people who are blind tend to read things linearly, and if you can create the table in an alternate view so that it is linear it will be easier for them to read and to understand.

Then finally, if you must specialize, if you feel that it is important for you to put up something unique in relation to viewers and data types and context, we also recommend that you provide a common view.

How am I doing on time? It's 11:00. Okay.

Just to kind of round things up... What's the focus of WebABLE? It's really to be a core information repository for people with disabilities and their partners. Users who are blind, visually-impaired, who are deaf, who have disabilities, will have direct access to all the links to all disability and accessibility-related information all the way across the board.

I have received a lot of help and a lot of direction from providers who are interested in the needs of people with disabilities, so I am constantly barraged. I can never keep this site updated fast enough for all of the new sites, and since I do this on my own time I'm usually running up between two or three o'clock in the morning trying to update things. So that will kind of give you some idea.

The folks who are sponsoring this is a small company up in Pelham, New Hampshire, called the Desk Tech Group. They've been fantastic in providing me with all of the support there. It provides links to solution providers and manufacturers and it provides links to research centers and consulting organizations in the context for non-profit organizations.

In the back, again, I mentioned that I left a handout called Access That Text. If you didn't get that, make sure that you do. There is a list on the first couple of pages of several URLs. Because we're running short on time, let me point you right now, if you have those, to some very significant sites that you'll want to go to right away besides WebABLE. You can get to all of them from WebABLE, but here are a couple of them.

The first of all is the NCSA Mosaic Access Project Page. That's about midway down the list there of the WorldWide Web sites, under the research centers and projects. Would you like me to read out the URL? Okay.

The URL automatically is <http://bucky.aa.uic.edu/>. [That last character is a] slash, not backslash. This is where one of the first of our projects for accessibility started, and we're still working with NCSA on accessibility. The chair there for this is [Drew Browning]. Drew is a quadriplegic at NCSA. He's been working with the folks since they were working on developing *Mosaic* back a couple of years ago.

The next is the next one in line — Project Do It at the University of Washington. They are currently looking for young people to give scholarships to for coming to their university to teach them and provide them with high-tech education. They're excellent. The URL there is <http://weber.u.washington.edu/>.

The next two are at the very bottom of that list, under research centers and projects: Trace Research and Development Center, which is <http://www.trace.wisc.edu>. Trace is, in my own opinion, probably the leading research center in the world working on accessibility for people with disabilities across the board, not just on the Internet and the WorldWide Web but totally across the board. I have been working with them for several years now on just a variety of different access things.

They have all kinds of guidelines; HTML guidelines that are up there. The HTML guidelines, by the way, that are available at Trace are in pretty good format here in the back, so you'll want to make sure that you get those.

Then finally, one of the local sites here which is, again, a fantastic site: the WGBH Descriptive Video Service site right here in Boston, <http://www.wgbh.org/pages/dvs/dvshome.html>, and you will see at this site several examples of descriptive video services for the individuals who are blind. You will also be able to find links for close-captioning and how to include that. All of the guidelines for how they are actually doing that on the Internet and the Web are located there.

I apologize for not being able to show you some of the sites. Actually, we're having some server problems and we haven't been able to get to half the ones that I've wanted to show here. But as I mentioned, if you go to WebABLE and if you'd like me to give you that URL again, I will. I think it's actually located right here. Let's see if it's up here... No, it's not on this page. It's www.webable.com/ — you'll find it there.

If you're planning to come to Internet World '96 in the spring, I will be giving presentations there actually showing how to build descriptive video, close-captioning and voice synthesis, and some of the work that's being done for the Internet in accessibility using voice output for the blind. Thank you.

INTERNET VILLAGE COMMUNITY OUTREACH ON-LINE



MODERATOR

Laverna Saunders

Dean of the Library and Instructional & Learning Support, Salem State College

SPEAKER

Lisa Kimball

CEO, Metasystems Design Group, Inc.

Laverna Saunders: My name is Laverna Saunders, and I'm Dean of the Library and Instructional and Learning Support at Salem State College. Salem, as you know, is one of the oldest communities in the United States, and a place where many witches do live. Last night the spirits were restless, and Salem was selected to be a point of presence on the Internet. We're working on a community network. One recommended title was the NetWitch. That hasn't been adopted, but you do see a sense of humor on the Net.

Our next presenter is Dr. Lisa Kimball, who has been co-owner and senior consultant with Metasystems Design Group, Inc. since 1983. She is a specialist in applications and electronic networking and the design of virtual spaces for organizations, teams and on-line communities. She is also a consultant on the implications of new technology for education, business and society. She has extensive experience in facilitating on-line groups and training moderators on multiple networks, using most of the software environments available today.

Her company created the MetaNetwork in 1983 as an electronic community to support a wide variety of individual teams and organizations. Lisa has taken the lead to create and facilitate general discussions as well as special events, performance arts, seminars and interactions with the guest resources for the MetaNetwork, which currently supports more than 6000 accounts. She is also responsible for training, coaching and supporting moderators for private groups.

She has two master's degrees and a doctorate in educational psychology. Her dissertation — and I enjoy the title — was "The Nature of Expertise in Senior Executives — The Role of Systems Thinking."

Dr. Kimball's topic today is "Community Outreach On-line," and I will let her give you her e-mail address and URL at the conclusion of her presentation. Thank you.

Lisa Kimball: Thank you. It's fun to think of being near Salem. Actually, my great, great, however many it is, grandmother was a witch in Salem, who unfortunately was actually hung during that time, sometime long ago. But it's always made me think how perhaps there's a little magic in me or something.

This is a topic which is really near and dear to my heart because in my view the real power and excitement and value of all this networking that we're talking about is not in access to lots of information, although some of my best friends like information. But it actually relates to relationships, and that the thing that the WorldWide Web and Internet does, the thing that it gives us is an additional tool, ways to organize and define and support different kinds of relationships among different groups. The information part, while valuable, is probably going to have less of the revolutionary impact in the long run than the relationship aspect, the community-building aspect. And so that's where the notion of using this tool to do community outreach lies, to build communities using on-line technology is something very important to me.

Now, when I talk about relationships, that's not the kind that I want to focus on, which is what you generally hear in the media. I'm very frustrated with media coverage of the on-line

world. When it's the equivalent of Sweeps Week, we get the inevitable story of pedophiles on-line, people that meet and get married on-line; there's sort of a repertoire of favorite stories along those lines, and what I'm talking about is something I think is much deeper and more important than that. So although we're talking about relationships, we're not talking about that kind of relationship.

The other thing that I want to stress is that in my view the real impact, the important impact of what happens as a result of on-line technology is what happens after you log off. If we're thinking of how we're designing and using environments with these tools, it's not so that we can all go move in and go live in cyberspace, it's so that what's available in cyberspace will give us things that we need, relationships that can support us to enable us to pull the stuff off in the world that we want to pull off. And so that's what I mean by community outreach. Not to go snatch up all the members of the community and haul them on-line to go live there, but rather how to use on-line technology to do things in the community to make things happen whatever your particular interest is, whether it's something like literacy or doing something for the homeless, or helping people who don't have jobs, or providing support for people who have particular kinds of physical or mental disabilities or a whole range of other possible things that you want to have happen out in the community. So that's what we're going to be talking about.

What I'm going to do is talk a little bit about a framework and then I'm going to show some examples of some applications and talk about them. Then I hope that we'll be able to do some interacting together about what might happen.

There are really a couple of different ways that people tend to think about how they're going to use the WorldWide Web to support outreach. One is tell people about the other stuff you're doing, and this currently is maybe 90% of what you see out there. It's basically somebody putting something on-line which is telling people about what we're doing off-line. More powerful, and I see having huge potential but much less use so far, is actually using the Internet-based tools to do something you couldn't do before, not just to tell more people about what you're doing but actually do something different, something that might be qualitatively different. I want to talk about what some of those kinds of things. What are these new options?

One of the things that people find who are moving into this area is that it tends to be something that just sucks up planning/drill kind of processes. We've had a lot of people that we've worked with that put together a committee, like the executive says in this quote, "After six months, I realized that our planning committee was still arguing about the process for deciding which documents were going to be re-packaged in HTML, and we still didn't have a Web site."

I made this slide for a talk that I gave a little while ago, and they still don't have a Web site because they're still so busy trying to figure out what all the policies are going to be and what all the possibilities are and "How are we going to get up to speed about all of that?" that they never got around to doing anything. And this medium is a much more amenable to a cybernetic process than that.

So I hope that one of the things that you'll get out of this morning and the conference in general is the message that the way to go is to do something, then pay attention. Be conscious of what you're doing, learn from what you're doing, and then do something else. One of the things about this medium is that it's much more forgiving than the old paradigm, the information technology applications that we knew about. When we first started working in this area, and that was back in 1983, if people decided to create an applications environment of some kind and do all the programming and so forth, they better be right about exactly how the interface was going to work and what the menu was going to say and what platform it was going to be on and all that kind of stuff, because to change any of that you had to redo the whole thing. It was a major effort.

A lot of times the people in organizations that have a history, the people in your IS department and in your computer services department, very often come from this old paradigm world. They really want to be sure everything's going to be all planned out and exactly right before they even start, because they remember what it was like when you got on-line and said, "I don't like menu item number 6. I want it switched around." That meant days of work. But that's not true in this new Web-based environment. You can do a lot more on the fly, be a lot more iterative and have generative type development. So don't be afraid. Just go for it and do something.

Now, just to give you an idea of some of the kinds of things are people are doing, I created a little hierarchy of what I've seen people doing, a hierarchy of what I think of as the lower-level applications, [and they're] down on the bottom of the slide. By the way, I did hand in master copies of all of these to the CD-ROM maiden, so whatever it is they're going to do to put it together and make it available, it will be available there. If you'd like it sooner, you can leave me a card before you go and I'll send it to you.

Down at the bottom we have, again, what I see as the vast majority of what you see on people's Web sites. It's a different way to distribute the same old stuff. So if you've got a brochure that's about something that you're doing, and I have an example here that I cleverly gave myself some links here somewhere, if you have something that tells about what you're doing and you want to tell more people about it, one of the things that you can do — I don't know why this isn't automatically loading images — maybe I just don't understand Macs, but... There we go. Okay.

Kellogg has an example of a program like this where they've got a lot of stuff that they're up to. For example, one of their community outreach things has to do with total quality schools, and so they've got the stuff that they would send you in the mail, were you to call them up and ask them, and it's available on-line.

That means I got to see it because I wouldn't have thought to ask them for it. It's a good thing to do because it means more people might have access to it as the search tools get better. If I'd been trolling around for total quality schools, I might have found this. So even though I've characterized it as kind of a low level application, it's not that it's not a good thing to do. It's just a fairly basic thing to do.

If we go back to that other slide, that's a perfectly good thing to start with, do that at least if nothing else. You've got stuff that's already on a disk or on somebody's word processor, and it could just as easily be made available somehow on-line. If you're interested later, I did some brainstorming with a group yesterday about some of the ways to pull that off if costs are an issue.

The next level up is where you go beyond, this has a little hypertext in it where you can go to one place or another, but it's possible to... That's a different film. OK. Excuse me. I forgot I wasn't home.

The advantage of hypertext is that it allows you to get people through your information in a much more complex way, and so one of the things that you might think about is some new kinds of information that you didn't used to be able to make available so easily, but now you can.

An example of one of the groups that's done that is a group at Georgetown that has a very interesting site that relates to stuff about medieval history. They're trying to make more presentations out in the world of people that are interested in that kind of thing, and so they've created a very complex, hypertext-based site with a lot of nice graphics on it. It takes a while to get through it, but you'll notice all these things that are underlined and in color are different places you can go, and some of them are at other universities. What they did is pull together in a hypertext way a lot of very interesting information. This is a new kind of program they can do

now, be a clearing house or a conduit, and that's another level of the kind of thing that you can do.

The next level up is to go beyond simply doing the same information but in a different way of organization. We might as well see the blimp, as long as we're going to Goodyear. Goodyear has a program where they're trying to help you figure out what kind of tires you have. Now, obviously, they have a motive for doing that. That's a commercial motive. There's the blimp. But you can also find out things like driving tips. This is an example of the basic hypertext brochure kind of thing. But what they also have is the tire selector, so they're using the basic interactive quality of the Web which is the ability to do forms. You can fill in stuff about what kind of car you have and what kind of tires you have and things about what you care about, whether you care about the looks or whether you care about safety or whether you care about performance. And after you fill all that out they bring to you a customized piece of information about what kind of Goodyear tires are the right ones for your car. If you fill in your zip code they'll tell you where you can go buy some.

Although this a commercial application it's an example of a way of giving information that could also be very useful for a lot of people who are doing more community oriented applications.

For example you could, as a mother, fill out something which gave information about when you needed child care and how old your kids were and what some other aspects of your life were all about, and the database could give you back some options for what kinds of programs were available in your community and who to call to get them. Instead of my having to be the searcher and trolling all through that, we're using the power of the computer to give that information back to me. That requires an investment on the front end on the part of the organization that's sponsoring it, but it's a tremendously useful thing for people out there.

You'll notice Meckler has done something similar. They've got a questionnaire-type thing on their page, if you've looked at the one about the conference where you get to say what kind of computer and stuff that you have and what sorts of things you're interested in.

Now, what I think of as a higher level of doing an Internet-based communication strategy is something where you're actually trying to bring people together into some kind of community.

An example of this is the *Hungry Mind Review*, which is a bookstore publication in the Twin Cities in Minnesota. It has developed a site where you can do all the stuff you'd expect to do, read through things and check out stuff. You can also fill out questionnaires, look at back issues, find out what's going on, and you can do things like participate in discussions. What they make you do is sign up for being a participant and once you've done that you can get into threads, which might be about a particular book. They might be about political topics, all kinds of things. They tell you about who's coming to the review next and who's coming to the bookstore to talk, all those kinds of things. They've gone beyond simply providing information about their bookstore and they're actually now, because they involve interactive on-line discussions, trying to create a community around that bookstore.

What's interesting is because it's a Webbed community, it's not just the people who are nearby enough to come by and come in and come to the author lectures. it's anybody who can float off to their Web site. So it's a very interesting kind of application.

Now this is much more complicated than just the simple, "put your brochure up on the Web by using one of those cool tools that people have on the show floor that take a document and zip it up and give it some colors and icons and things." As this cartoon says, "Granted, it doesn't have the versatility of our other models, but most people find it much easier to play."

The point I'm making here is you get what you pay for in terms of the human resources and consciousness resources you put into stuff. It's more complicated and harder to do these

more complex community outreach applications, but the payoff is much bigger, probably just like a grand piano would give us a little more than this in the long run.

This is what I call a “purpose matrix.” It’s a way that you might think about how to figure out your strategy for designing some good on-line applications. Across the top — and this is not a dichotomous kind of a dimension — four-box models is what you get in the template program in my word processor anyway. Think of that as a continuum from applications where mainly what you want to do is disseminate information out; from the point of the user, they’re scanning around to get information. On the other end of the continuum we have situations where what you want to do is make some action happen. You want to implement a program. You want to tantalize action, get people to do things. Probably you suspected my bias already that getting people to do things is going to have a greater impact in the world in the long run than just giving people information. So far there’s not a lot of evidence that simply giving people information, for example about why it’s important to recycle, or why they should stop smoking and so forth, doesn’t itself create change in behavior, and we need something more to do that.

And down the left-hand side of the continuum we have people that I’m calling “known constituents,” people that are either members of the organization, clients of the organization, or obvious fellow traveler constituents that you know about on one end of the continuum. On the other end of the continuum are this unknown public, the surfers, the whoever’s just out there that might be getting stuff.

For organizations, the smart strategy needs to be comprehensive and include activities and things that you might be doing that would fit into all of these boxes. But I do have my bias about which ones are the highest leverage and give the most payback.

If you look at the upper left-hand corner, if you’re just trying to get information out to people that you know, there’s the on-line version of providing them with newsletters. One of the nice things about on-line is you can provide them with back issues very easily and at low costs instead of having to print them out and all that. Put them up there once, and there they are.

You might just be giving them information about who to contact for various stuff, clippings services, those kinds of things.

For your unknown public, that’s where your on-line brochure goes or your catalog of information, things that “shoot a gun up in the air and hope a duck flies by” kind of thing. You don’t really know who’s out there or what they’re going to be able to do, but you offer them something.

Over on the lower right, if you have an unknown public, but you want to call them to action, that’s where you want to do something like weather campaigns or they might be able to do on-line registration.

As an example, The Children’s Defense Fund has a thing that allows you to actually write a letter to a member of Congress. They give you the form and everything right there for when there’s not so much Internet traffic that you have to wait around a long time, but we’re all waiting for that to come up. This is where you could do questionnaires, gather information in as well as get information out, do these higher level kinds of things.

That upper-right box, that’s the box after my own heart, because that’s really where you get stuff that is more than you would expect to get out of these other strategies. This is where you get the community building, doing something actually in the real world. This is where you could have a task force and they could use the Internet to get to a place where they could work; and this task force, instead of only consisting of people that have time to get wherever it is they would need to get on a Wednesday night, consists of anybody in the organization, no matter where they are, that needs to get around.

You might have a focus group to bring them together to talk about stuff that you're doing and to provide feedback and work on it. Again, you're not limited now to just the ones that would let you go specifically to a particular place and time.

Also, this is where I would put special events. This Georgetown group just had a conference on cultural friction. There were amazing things in this for those of you who are into esoterica; they posted papers here. Let's say I'm interested in this paper, the practice of medieval cultural studies, and I've read this and now I want to make a comment on it. First I can look at comments other people made on it. (Except for not right there I can't. Welcome to the wonderful world of the Internet... Let's see if I can do this one. Well, I'm not an academic. Those of you who are academics probably get this more, but there was very "dancing on the head of a pin" type stuff here.)

Here are some examples of comments. I can look and see "What did these other people have to say about this paper?" Now I can say what I have to say about the paper. What they've done is more than simply broadcast information about the conference, "We're going to have one and here's what it's about." They've gone a step beyond in actually providing content for those of us who couldn't be there. On top of that they've created a community around this, where people that are interested in this kind of stuff, and I think it's really good that now they have some help to find each other, are able to get on and make comments and look and participate. It's not just the recipients of information.

The next version of this same kind of way of looking at things is another four-box model. I admit to being an organization development type, and there's some thought that we see the world in four-box models. This is another version that shows some of the specific Internet tools that people are using in these different boxes. The labels of the squares are slightly different, but it's the same idea.

Disseminating information to teams or specific organizations is where, obviously, e-mail and your moderated mailing lists and those kinds of things can make a difference, and so on around. One of the harder ones to pin down is when you have a public group and you're trying to call them to action. So far there haven't been a lot of really good tools for that. People have tried to do electronic town meetings for example, and we've been involved in the Vice President's Task Force on re-inventing government and some of the kinds of things they've been trying to do. Let's see by chance if we can get there.

They have been very frustrated with the problem of getting comments that make sense to use. If you get thousands of e-mail messages in from the field, that's not very processed, and you can't really do much with it. This mass scaling-up of input is a problem, and there aren't a lot of really good software tools to process that kind of thing. But electronic conferencing, is what we focus on, and other groupware tools are very good for that upper-weight project.

Again, if you're trying to do a strategy that includes all these different boxes, it can feel a little bit like you've bit a little more than you meant to chew, as this frog found out. But it's worth it. It's really worth it to be thinking of applications, not in term of "There are mail lists. What do I do with the mail lists?" or "There are Home Pages. What do I do with a Home Page?" but to think rather in terms of "What is the purpose of what we're trying to do? What is it we've always wanted to do in terms of community outreach that we haven't been able to do, but maybe we can use these tools to do?" so that your applications are really driven by things that are aligned with the goals and values of the organization, not "Whoopee-do, there's new stuff" and so we've got to get going with it.

We get a lot of calls from people where a typical call would be, "We've got to get some of this Internet stuff." And then, "Well, exactly what do you mean by stuff?" "Well, I don't know. The board met and they said we've got to do this Internet thing and I'm the one who's got to figure out how we're going to do that." That poor person often has no direction because

the board is not capable of giving any, to help them figure out “What does that mean? Are we doing this so that we can get more members? Are we doing this to provide value-added services to the members we already have? Are we doing this because we’ve had a financial cutback in our budget, so now we can’t distribute as much paper, so we’re going to do it another way? What is our purpose? What are we trying to achieve?” And it’s very important to drive applications from that direction.

This is the picture of the organizations that we all grew up in and that we know about, the conventional organization. Very often a lot of community service programs or community outreach programs start from an organization that’s kind of in the structure. One of the things that’s sometimes a challenge for people who want to do this kind of work using these tools is that the people who are in charge of the computers are the consultants that have been brought in to deal with the computers or one of those boxes or relating to one of those boxes, and you get some turf problems.

One of the things that’s neat about this technology is that there are some good strategies for escaping that. By nature it’s distributed and flexible, so a lot of organizations have found they needed to she said wrest control out of that.

Where you really want to go is [to the point where you are] thinking of either your organization or your project as something that looks more like this [diagram on the screen]; without worrying so much about what the words are, you can use the on-line or virtual environment to create groups of individuals, groups of projects that both go across functions within your own organization and make partnerships with other organizations.

One of the things that this technology allows you to do very well, and it’s really an important aspect of community outreach, is partnering. This picture here could be a picture of your Web site and the Web sites of two or three of your community corporate sponsors or local community college pieces of the program or sources from funders or other related programs. You could be using Internet or Web-based technology to link all those things up, and that could be a very good use of the tool.

Before I open it up to questions, just to see one more time if I can look at a couple of these things, let’s go back and see if we can get Children’s Defense Fund — just some more examples. The Children’s Defense Fund, as you probably know about the organization, is obviously focused on children, so they’ve got a Web site that shows children. And here’s their urgent e-mail from the president. They don’t want you to just look at the information about everything that’s bad or problematic going on with the bills in Congress and so forth; they want you to actually do something, so they’re in that call-to-action or implementation box. You can click right here.

So now I can send. It automatically gives me a form and blah, blah, blah I can say whatever I want to the president. I can even quote a document that’s one of the documents from this Home Page, etc., etc. What they’ve enabled me to do is not wait until later to go do what they’re telling me to do. They’ve created a space right on-line where I can do it and I might be more able to do it that way.

For those of you who’ve done letter-based campaign kinds of things, one of the things that’s really interesting about doing it via this on-line technology is that the form letter kind of thing starts piling up and just going right by a lot of members of Congress, because they get a lot of them. But if you can provide text that I can download into my own word processor and then I can customize it by adding some personalization and things about me and so forth, that can end up being a much more powerful letter. So that’s a very interesting thing.

I don’t know what that’s going to give me. That’s an example of getting people to actually do things on-line.

The National Performance Review, as you may recall, is where Vice President Gore set up an interagency project to try and generate ideas for what government organizations could do to change the way they operated in the way that everybody seemed to want. But because it was interagency, there was no single place where the people from all the different agencies could gather. After the project was over, which was September 6th, now two years ago, everybody went back to their agency, back to their own internal e-mail systems — which are many and varied within the government — and then in order for them to have a continuing place to be a community and to do a discussion, they created this environment on-line.

One of the things that was neat about it is that because it's a Web-based environment it means that you don't have to be part of the agriculture department or the any particular agency to participate in it. It means anybody who is motivated to and wants to get involved in this and join up and so forth can do it, without violating any of those security type heebie-jeebies that people in the sub-basements of many government agencies have, who really don't want the public signing into their proprietary computer because of whatever they're doing in there that they don't want us to see. The ability to create a conversation environment where people can get on and talk about what they need to talk about in a safe neutral virtual space gave them something that they wouldn't have had otherwise.

There have been a number of applications like this out there where maybe several organizations working together on a project, say jointly working on a community project, and they all have this thing where they don't really want it to be in any one of the organizations bailiwicks, because that's threatening and it gets to be a turf thing: Who owns it?

One of the great things about the Web is you can really create a collaborative multi-partner kind of situation where they can keep their information on their computer and we can have our information on our computer. We can get to both things, but it's nobody's thing that just they own. So that's an example of doing that kind of project.

What this is is a list of the topics that these folks have been discussing. Let's look at a recent one to give you an idea. The budget battle, the topic du jour, this one I happen to know. That's a person from the Internal Revenue Service. This is a person from a personnel agency. Brad is somebody who used to work for the government but is now outside as an economist and accountant. They're all able to have a conversation. Dave is a local government official from Pennsylvania and so on and so on. It gives you a way to have a group of people from different places gather together to have a conversation they need to have, whatever that is.

Let's look at another example now that we're working here.

ArtsWire is a coalition of arts organizations. There are now about 600-some-odd arts organizations. They're everything from very big ones, like the American Craft Council, to much smaller ones like the Native American Craft; I think they're Craft Association or Craft Club of Eastern Wyoming. We have a whole range, some of which may have only two staff people. Of course, being artists they're somewhat graphic-intensive, so we all get to watch paint dry while we're waiting for the graphics to come up. But one of the things that they've found, again, is that each one of these organizations sometimes even competes for grants with each other. So to form a coalition of this type of group, it was very hard to find a safe neutral space. The on-line space gave them a creative place where multiple organizations could put their stuff under one umbrella; you have the one-stop-shopping aspect of things. At the same time, it allows them to have multiple kinds of discussions.

Now here's their sort of front door-type of thing, and one interesting current thing that's going on is there's a big conference in New York, which was on "Cultural Diversity." They had a team of people at that conference providing reports and opportunities to comment to the people that were on-line about that conference. This is a very nice kind of outreach application. There's no new conference activity, because I already saw what was there. These

are for example, you can see what the comments were about, who was speaking, a call for a cultural contract with America and so forth.

One of the advantages of having this on-line for these multiple organizations is that a lot of them can just suck some of this material off-line and put it in their own newsletters and other media. It's not just being on-line and never getting off it, it's using the on-line as a point for all the interesting things that people might want.

Let's just take a look and see what a cultural contract with America would be like. The Caribbean Cultural Center, which was the sponsor of this conference, they were sort of like a White Paper... and there it all is. We could take this paper and we could make it part of our discussion group at church, or we could bring it into our classroom, or we could print it out and talk about it over Thanksgiving, or we could have a conversation about it on-line. But the fact that it's easy to get to and in a common place is what makes it worthwhile for this group.

Let's see if there are any other examples. I want to show you one more thing.

I like to go to conferences and talk about the ones that I've gone to, so some of you may, if you're in the library community, be familiar with Steve Sizzler and the Apple Library of Tomorrow project. He has, for the last several years, had a conference called "Ties that Bind," which is about community networking. The one last May I happened to have gone to, and I wrote up a lot of the kinds of things that went on there and I put them on-line. And again, because they're on the Web, it meant that a lot of people that were working within free networks or in libraries or in other places could simply link to this site and be able to provide all the information there. It's an outreach and "small amount of work for a large amount of payoff" kind of thing. This was very good.

I also did a similar kind of thing with the National Education Computing Conference, where there are a lot of interesting sessions, and just so nobody would miss it I even covered the parties so that you could really get the feel for what it was like to be there even if you couldn't be there.

Again, one of the neat things that's growing is the multimedia capabilities of the Web, that allow you to do stuff, not only writing the text, but — I would have brought the really cool little Casio digital camera that we have that takes 96 pictures with no film — you just capture all the stuff, dump it into the computer, and it's automatically in a form that could be posted on-line. It's great for being able to show old pictures of neat folks, so that they can get the sense of who people are, and it's also a neat way to capture what's going on at a conference for people that aren't there.

This is an example of one of the pictures that we just took in the office and popped up on-line. You can do a lot of things with this. If you have multiple groups or have people having regional meetings, just imagine — you could just take a picture of what they wrote on the flipchart or on the whiteboard and pop it up on-line digitally this way, and it's a lot cheaper than those shared whiteboard type technologies. There are a lot of interesting possibilities.

This actually, now I think of it, wasn't taken with a Casio camera, but was done with something called Snappy, which is a product that you can get to go with a regular video camera. You might have to take pictures of your kids or grandchildren, and what it does is let you capture a frame and it makes it into digital form and just sticks it up. It has software that goes with it for Mac or Windows. That shows you what you could do with that.

The bottom line message is, "It's the relationship, stupid," to use the thing from the last campaign. It's really more about "How are you going to catalyze relationships in your community?" What kind of information are you going to push out at people?" You really want to find ways to use this technology to help you do things that you've always wanted to do. Wouldn't it be great if we could get everybody co-planning the conference with us instead of

just pretending that we're getting input, so that you're doing something different and not just doing the same old thing in this new medium.

But rather than not do anything, at least do the same old thing in the new medium and get going on that and get a feel for it.

My recommendation is, if you haven't started exploring this and its applications for your organization yet, one of the best strategies is to create what I call a "scout team" that would be a group of people from maybe both inside and outside the organization, whatever is appropriate, including your key people inside, and perhaps some constituents or customers or the members, to be a group that has full Internet access. They can go out there and look at what other people are doing, get experience and be in some kind of interactive communication tool use with each other, to talk about what's going on out there that we ought to be thinking about, so that you really have that base of experience.

If at all possible, don't get yourselves captured by the consultants, even though I am one. One of the things that I've seen a lot of, and particularly nonprofit organizations suffer from is, because people feel that they don't know a lot about computers or they feel kind of one-down about the knowledge, is that they allow fast-talking, whoopee-do, techno-nerd, wire-head types to come in and with a lot of mumbo jumbo to scare them into either thinking, "Oh, God. Maybe next year we can get into this..." so they don't even want to do anything, or they're looking at very comprehensive, very high-cost solutions which seem like a very big deal to have to put together all at once. What you really want is to find ways to get experience, get your toe in the water, try something easy and cheap, learn from that and do the next thing. The most important aspect of it is your knowledge of what it is you want to pull off, what needs to happen in the world that's not happening now, which is the reason for this community outreach program. You actually have a lot more knowledge than a consultant could ever have.

[Tape change]

Lisa Kimball: And play with the tools so that you can get a feel for what they can do for you in that regard.

So I think we have a couple minutes before everyone starts to dash if you have any questions or would like to make a comment. Anybody?

M: [inaudible]

Lisa Kimball: This particular one is based on something called [*Web Caucus*], which is a computer conferencing product that we have. And if you'd like to know more about it, you can give me your card or call from the number on the brochure. I'd be happy to let you play with it.

Other questions?

M: What are the demographics these days? How many people have browsers [inaudible] and what's the projection for growth in the next ten years, [inaudible]?

Lisa Kimball: Right. That's a good point. Well, there's a lot. It's happily changing and growing fast. One of the things that you might consider is that it is possible to get to a lot of this information that we've been looking at. Even using a text-based browser like *Lynx*. which you can use at 2400 baud with a 286 computer, you get all the stuff. You can't see the pretty pictures and it's not as easy because it's not as click and point, but it at least is accessible at that level. The strategy of the Internet service providers is to try and distribute a lot of software and get a lot of people on. Getting the software part hasn't been very difficult, and depending on

your community there are things available like freenets or local city nets or library sponsored activities that can get people on.

One of the things that we forget in community applications — and we worked on a couple, we worked on one in Santa Monica, California and we're now working on one in Salem, Oregon — one of the things about that is that every single person doesn't have to have their own computer in order to take advantage of something like this if you provide some public access, either from libraries — community precincts in the police department is one of the things Santa Monica did — and schools and so forth. If I get on-line on Wednesday and talk about some stuff, and you get on-line on Thursday and talk about some stuff, we're still having a very valuable asynchronous communication even though we're not accessing that from our own personal computer. So I think that's a very important point.

And I think in the session earlier — which I didn't attend, but I scarfed up the materials — [they said] the other important consideration is that there are people for whom do we interfaces that are not ideal, and we need to always be thinking of making sure that what we're doing is accessible by those people as well as by the click and point. The ease of use doesn't necessarily mean click and point. So that's a good point.

Other questions or comments?

W: Do you have any idea how many [inaudible] on an average?

Lisa Kimball: I don't, but I'm sure that information is available because you're able to track that kind of thing. That's one of the things in the session yesterday, and I think probably some other people pointed out — that one thing is hits, how many people show up. But in order to really capture information about what's going on and who's using your service you need to use some of the same kind of strategies you would in other PR or outreach things, which is to find a way where they tell you something about themselves. They fill out a form to get a piece of information, they sign up for a contest, so that they're saying, "Here's who I am and here's what I'm doing here." You know, like putting your business card in the fishbowl at the local restaurant. You need to do an on-line equivalent of that to really get information about the quality of the hits or the interaction that you're getting. You can find numerical numbers wherever the host is, and they can produce how many people showed up and they clicked on this or that.

W: I have a question in the commercial on-line services about partnering [inaudible].

Lisa Kimball: Some of those things do happen on on-line services, big on-line services, and we're doing a big project now with PBS, which is a big distributed network. Of course, they have all those local stations, and contrary to what Newt thinks public broadcasting is a very grass roots, local phenomenon. So some of that goes on.

In general, one of my beefs with the big commercial on-line services is that their idea about community outreach is not always the same as my idea, and that they're really looking for bodies showing up so that they can convince a sponsor that there's enough bodies showing up that it's worth paying the cost. Those of us that do this kind of thing know that a small group of dedicated, very focused people might get something very important done. But it's hard to talk to America Online about an application for a dozen people. That's just not what they're all about. And happily in the Internet world, again, it will be interesting to see what the future will be. I think those big commercial on-line services are likely to become more and more sort of consumer product-oriented because it's possible for a relatively small organization to have a

host hooked up to the Internet and do something without needing to go through that intermediary.

In the old days we needed those big intermediaries to get everyone on the “highway.” Now more and more the root to the highway can be very local and low-cost, and so once they’re on the highway they can go anywhere. And that service those big services used to provide us is no longer as critical, I think.

Way in the back.

M: [inaudible]

Lisa Kimball: Neat idea. Yes, one thing you might think about if you’re a small non-profit or community organization is that one of the things your corporate friend, sponsors, contributors, etc., could do for you very easily is provide you some space for presence on the Web. If they already have a Web site going, and they’re already paying the telco costs, putting your pages on there really doesn’t cost very much to them. So if it’s the kind of thing that you might ask for — services in kind — and that might be good to do, then check it out. Then do something else, because you could get experience and because all the files could then be moved when you were ready to do your own thing, having had that pilot experience, and then that wouldn’t all be just sunk costs. You could easily pour the bowl in a portable way, move it to another environment.

You’ll soon discover that I’m not the techie in our bunch. I don’t even use self-service gas, so actually how it works, I can’t tell you. I know a number of organizations where they’ve got one piece of the server, like an NT server outside the firewall, which is accessible by people outside the organization to do various things like their files of that type. That can be networked through the firewall to other stuff, so that people can’t get from the outside past the firewall, but you can go the other way. There are probably people in the other room over there that understand exactly how to make that work, which I don’t. But there’s probably a solution like that out there somewhere.

M:[inaudible]

Lisa Kimball: That’s a really good point. One of the things that’s so cool about this technology is that there’s greatly more diversity than there used to be in who can be providing the pieces in some or all of these various services. It’s really good to look beyond what you’re seeing on the nightly news and see if you can find something more.

One thing that has worked well for a lot of community organizations is to put together a group of people from the community to be part of the scout team, like I mentioned before. One of the things they could [inaudible] about is what’s out there that we may not know about. Maybe there’s a statewide network; maybe there’s an entrepreneur as part of start-up who would like to have some applications that he or she could talk about, and maybe you could be one of those and do some kind of little quid pro quo. Maybe there’s a corporate partner. Maybe somebody’s got a sixteen year-old with time on their hands — there are a lot of different ways to do it.

The key thing is to go out there and not be a person who is saying, “Well, I don’t know anything, so I have to get somebody else.” You know, you can learn about this the way that you learn about other things. Vic Sussman said yesterday, and I was cheering “Yeah!” in the back, that it’s funny how this computer technology, even network technology, is the kind of thing that people are willing to admit that they’re dumb about. We wouldn’t admit we were dumb about other things. It’s not that complicated; even I’ve been able to do a lot of this and I have no idea how it actually works, anymore than I know how my car works. I just know how to drive it

some place that I need to go. And if I need something to go on in the middle, I do the equivalent of going to Jiffy Lube. In my office, I go, "Scott, help." You need to find somebody like that to help you. But be sure that what's driving it is what you want to do, not what techies are telling you you ought to do.

Somebody in the middle had another one.

W: [inaudible] fundraising?

Lisa Kimball: Fundraising is an important thing. You mean in terms of how people have strategized to fund raise on the Net? Well, one thing about the Net which is kind of interesting is that you can put credit for people on quite easily, so that's one thing that people have done. For example, when a corporate friend has let them have some space or something else, you can have a line on the bottom that says "Web space and other resources compliments of," you know, sort of a cyberspace version of the bowling shirt thing. That way you can give people credit. Generally, people that are into this stuff tend to be proselytizers, so a lot of times they enjoy the process of helping.

The hardest thing about fundraising right now is that people have not developed very sophisticated evaluation strategies for how you communicate to a funder that this has been something worthwhile and important. ArtsWire, for example, had a lot of grant support funding from the New York Foundation for the Arts and the National Ballet for the Arts has went into.

How do we demonstrate? I'll hype my own favorite technology, but what having the interactive part does for you is it allows you to create the kind of testimonial/anecdotal material that can be very rich. So if you have people on-line telling stories about how I have this problem, and I couldn't figure out this or that...

Iris is a network of teachers. I couldn't figure out how to incorporate the new math standards into my classroom because I never had statistics myself. Then I got on-line on the Net, and I work with other teachers and I got this information, and as a result the 27 kids in my fifth grade class are now doing the work.

You've got really good, rich material, and with that material you can tell quite a good story to a funder. Having that aspect to capture that can be helpful. That's probably the biggest missing piece I think for fundraising. "What is it I'm going to tell people is going to happen as a result of them giving me money to do this?" and then "How am I going to prove that it did happen?"

So that's another good arena for the academics out there, to help us out with some new tools. John's going to do that. I know in the audience you've already solved that.

M: [inaudible]

Lisa Kimball: Great.

Any other questions, comments? All right. Well, thank you. I enjoyed being here. If you have any more questions, come on up.

INTERNET VILLAGE
EDUCATION AND LONG-DISTANCE LEARNING /
EDUCATIONAL TREASURES ON THE INTERNET



MODERATOR

Laverna Saunders

Dean of the Library and Instructional & Learning Support, Salem State College

SPEAKER

Gregory Giagnocavo

Consultant and Writer, Wentworth Worldwide Media

Laverna Saunders: Welcome again. This is the Internet Village track. I hope all of you picked up a brochure, *Classroom Connect*. They're on the literature table at the back of the room.

M: We can't hear you.

Laverna Saunders: (OK, now can you hear me?) Our next presenter is Gregory Giagnocavo, an internationally recognized Internet speaker, author, and Internet consultant. Gregory has played a major role in bringing the myriad educational resources of the Internet into elementary, middle and high schools. As director of Wentworth Worldwide Media's Classroom Connect Product Development Group, he has an in-depth understanding of the enormous educational potential of the Internet. He is much in demand as the speaker at local, national, and Internet educational technology meetings, and is known for his ability to capture and hold audience interest and giving informed forecasts of new applications and educational opportunities on the Internet. I believe if you are in the exhibit area and you see the booth, there are a number of his books on display and you can order them.

In addition to the *Classroom Connect* newsletter for K-12 educators, he is the author of several books, including *Net Power*, *Resource Guide to Online Computer Services*, *The Educator's Internet Companion*, *The Educator's WorldWide Web Tour Guide*, and the *All in One Internet Kit*. He's currently working on a new project, *The Educator's Funding Guide*. His e-mail address is connect@wentworth.com, and his URL is <http://www.wentworth.com>. So now I'd like to introduce Gregory Giagnocavo.

Gregory Giagnocavo: Can everyone see all right? I know that some of you are on the wings there. If you'd like to move towards the center, as convenient, that would be great.

My name is Greg Giagnocavo, and we're with Classroom Connect. This presentation is really to get you excited about the different possibilities of using Web sites in the classroom or in the teaching experience. Many people usually exclaim, as they flip through our books when we explain the Internet, "Oh, I didn't know that was on the Net" or "Oh, I didn't know that, isn't that interesting," and "I didn't know that was on the Internet." And so that's sort of what I could have called this, "I didn't know that was on the Internet."

We'll go for about 45 minutes and have a few minutes for questions. If we go along and you have a question about something, I'll try to take it, but if I ignore you it's nothing personal, we'll just keep moving. And we're basically going to go through and have sort of a bit of "eye candy," as it's called, and see what's on the Internet for schools.

Every URL that I refer to, every screen that's up here, is in the hand-out that has been given to you. There's an Educator's Internet Resource Card, it's called. It's yellow, and it has several hundred sites on it. These are in there, and they're marked on there.

At our booth, as Laverna mentioned, we have a number of other products that you might be interested in. So educational treasures on the Worldwide Web, we're going to take a fast tour through some of these, and we'll slow down a little bit later on. The one that is really interesting is FedWorld.

FedWorld — regardless of what you think of the current administration, this administration is throwing tens of millions of dollars into putting on government information that really we paid for already, but we're being asked in the last, say, ten or twelve years to pay for again, sometimes up to \$200 an hour if you're at Mead Data Central, or Lexis and so on. We are paying for the same information all over again that's now being ported to the WorldWide Web so you can get to it anywhere in the world with a simple browser. Over 130 databases are on FedWorld: Census, Department of Commerce, and so on. We'll take a look at some of those later on as well.

The Department of the Treasury is on the Internet, and you can see that we have a Who's Who in the Department of the Treasury; and in case you really wanted to see his picture, the current head of these departments is on Treasury Bureaus, Treasury Services, What's New. One of the things that you'll find from a lot of these sites is they might start off seeming sort of perfunctory, sort of telling you this is the Treasury Department, this is what they do, and that's a little bit boring sometimes if you're not really interested in that particular aspect. However, if you'll take a little time and you'll dig a little bit deeper, a lot of times you'll find lesson plans that have to do with this site. And if you dig deeper and deeper, you'll find lesson plans, you'll find stories, you'll find personal glimpses and so on.

The Webmaster that designed this site's first charge was to get it on-line, and they've done that. But as they've had more time and it's seasoned — it's been now six months for many of these sites, some up to a year old — you're going to find more and more interesting things buried in these sites. So I encourage you, if you find something that's even of a little bit of interest to you, dig a little bit deeper and you'll find more and more interesting things as you dig deeper into the site. And of course they're free for downloading and reproducing in most cases to use in your classroom or in your experiences.

NASA has many, many sites on-line. This particular one is, I guess, is one of the Home Pages that leads you deeper and deeper into what might even be described as other Web sites. It's like a labyrinth, the way they have it set up. Everything that you see, of course — how many of you are on the Internet now and are using a graphical WorldWide Web browser? Okay, great. We've got a good crowd for that. Most of you are, so I won't explain some of the other details of how to use a Web browser. I've been in sessions, though, where we've had teachers that smiled and nodded enthusiastically, and said it was great. And they said, "By the way, do I need a modem to get on the WorldWide Web?" So, you know, we have all different levels of experience.

I was surprised to find, when I was putting together an article recently, that this NASA Center Map actually describes many more NASA centers than I even knew existed, anywhere from the Goddard Institute for Space Studies in New York to — there's another Goddard Center, it's not even on this map. There's a Jet Propulsion Center, Jobs in Space Center. Everybody knows the Kennedy Space Center, but you may not have known about these others.

And when you click on these, take it to WebSite Central and then deeper and deeper, you'll find all kinds of interesting things to use in the classroom or to use in studies, for developing lesson plans or developing schematic units that would range anywhere from the actual astronaut reports that they file after every space shuttle mission. They actually file a report that says what happened to all these experiments. They read about how they're going to go out in outer space and maybe try to grow crystals, or develop a new method for analyzing

something in weightlessness. And they have to file a complete report. Well, those reports are available in most cases.

You can download space patches, every patch. There's a crest that's designed for every space shuttle mission, and you can download all of those. There are lots of interesting things, including lesson plans on-line as well for every grade and every interest level. There was one I downloaded from a space shuttle report; they had taken some bees into outer space, so I thought, "Well, what's so scientific about that?" And they were trying to see whether bees can fly in outer space, and if they fly, do they still do directional dancing, and what happens when they're in weightlessness? They found that when they go into outer space — this is a report now that I'm reading, it's about 30 pages long — and it says that when they got the bees they seemed to be a little lethargic, and they moved a little bit, and they seemed to cling to the side of the box. And I'm thinking, well, whatever. And at the end it said something interesting, "However, all the subjects died." And so I thought, "Well, maybe that has something to do with, I don't know, being weightless."

But if you dig deeper into the report, this is what they do with our government money; they not only took these bees up, they died, and I guess they did little mini-autopsies on them. They found out that the reason the bees died is that the astronauts had forgotten to take any food along, and they simply starved to death in outer space. So it really had nothing to do with weightlessness, and they just simply starved.

[Library of Congress] is a gargantuan site. There's so much here you'd spend an hour just visiting this site. Again, there are lesson plans, and if you dig deeper there are branches off into many related areas, and lots of exhibits, and they have many, many graphic exhibits. So there's many traveling exhibits that end up at the Library of Congress, and you can actually view them on-line. You can download them, remember, and save them to your hard disk, actually build units around using the information you find on-line to put into a multimedia presentation such as *HyperCard*, or *HyperStudio*, or any of the other *PowerPoint* different presentations, and actually take that presentation when you're done and post it back out on the Net again as sort of an iterative process in learning.

How many of you are in K-12 education as opposed to higher education? Okay, about half the crowd. All right.

UUNet Public Library is pretty interesting. So what you're going to see — I'll point this out as far as a trend — you're going to see more and more robust sites. In the very early days last summer you saw sites about things put up by people; now we're seeing actual commercial ventures, still free, and we're marrying the commercial ventures with the education.

Traditionally commerce and education have seemed to have been at different corners of the ring, and they didn't know where the common meeting ground has been. Suspicions arose. Education always seemed to be a little suspicious of business interests when it got too close to education, and I think that we're finding on the Internet that you really have a common meeting ground, where we meet, I think, quite well. And you're having a lot of information being put out for the benefit of education, and yet businesses feel they're getting paid from their end for it, and education doesn't have to pay for it.

And you'll see a lot of sites being put up. I think they'll be more rich, more interactive, and they'll be sponsored by other corporations that believe it's in their best interest to put sponsorship on some of these sites, as in the Public Library. As of recently it hasn't been sponsored yet, but it's very rich, very robust, almost like a homework helper with thousands and thousands of links buried deeper into this site.

[Here's a site with] famous paintings on-line, and this site is obviously called "Web Museum." You can actually click on these links and actually find out biographical information about the artists. [There's] lots and lots of history associated, and, many times there are links

to other things that happened in history around that time. So if you're teaching in a K-12 environment or if you're learning in that environment, you have cross-curriculum going on here. You might be looking at something in art, discussing things about the author like biographical information, or linking to the country and then linking to historical events that happened around that time. And you have sort of a cross-curriculum learning adventure going on.

Here we click deeper into it [and find] bio's, pictures, and information about that particular period. And clicking on these smaller thumbnail sketches will bring up the full sculpture in this case.

The Smithsonian has changed their Page a couple of times. I will give them credit for being one of the first to put a professional Webmaster in, and they have a very, very robust site. I'll use that word robust a lot. You probably won't hear it the rest of the day after this session but robust means there's interactivity, it's really rich in the content areas, very creative in the way they present information, and very, very useful.

I took my family down just after I did this presentation, as I prepared it, and it just so happened we were going to spend the weekend down there as I was doing another presentation for AFT. And lo and behold, there's the Smithsonian. I didn't know there were so many affiliated sites affiliated with the Smithsonian. But [if you] print out a map, take it with you, find out the hours of operation and when you can get in there and the history of the building, you can find out about people that maybe designed that building or were instrumental in founding it a long time ago and you can print all that information out. And you can have cross-curriculum learning, as well as the practical aspects of finding out the things about visiting the museum.

Places, people, activities, perspectives, resources, products. I spoke to the gentleman that's in charge of this project. Actually this year — and you'll see if you've been out on the floor — some of the multimedia players [are] coming along. *HotJava* [and] Macromedia players are being built into the Netscape [products] and some of the Adobe things. They're actually going to have, at the Smithsonian when you go there, the interactive projects and the exhibitions, the things that you can actually touch a button and make it happen, and the [Vandagraf] generator where your hair flies straight up in the air. They're actually going to put those on-line, so you'll have on-line interactive exhibits, as if you were actually there as close as you can be, cyberspace-wise.

So you'll be able to activate different exhibits and see things fly around, your hair fly up and different things like that. They'll have those built into the site. Again, greater interactivity which helps people not only stay interested in a site but it makes it more valuable, more of a learning experience, with lesson plans and other helps in the classroom and with things for putting together semantic units buried deeper into the site of the Smithsonian.

Here's what I was referring to: a map of the mall, all of the different affiliated centers and institutes.

[Here's an area called] Paleontology Without Walls, a pretty ambitious project, and this is sponsored by Berkeley. It's a very interesting site. It's a site, really, for any field of study, no matter what your interest is or your proclivity or your hobby. There's anything on-line that you can possibly imagine.

Those of you that have been on the Web for a while already know that, but particularly now, if you remember back a year ago if you've been on-line...how many of you have been on-line on the Web for more than a year, going back at least a year? It was a little sparse finding things last year, wasn't it? You didn't have the sophisticated search engines you have now. Now you can find pretty well anything with a few keywords. The only thing you have is an embarrassment of riches, which is why we feel we exist with our newsletter, and that is if you

type in “biology” you might get excited at first that you have 2,700 hits back. But if you’ve taken some time to try to visit 2,700 sites, you know that you just can’t do it.

So there’s really almost too much out there now and we need something, more of a filtering mechanism, and that’s why there are many companies and many projects where they are actually filtering the sites out, filtering many that are visited, like we do. We pre-visit them and pick out the ones that seem to have the most content, the most relevancy related to the topic, and we put those in our Web site. And there are many Web sites out there; we’ll see a few of them here.

You can visit foreign countries, explore remote sites and download information from servers in that country, or servers that are about that country. In this case we’re visiting a server in South Africa. And here we have an interactive map, these quick little maps, [but there’s] a lot of neat technology coming out that will make this actually look sort of primitive. You’ll be able to click on any section of South Africa, and when you click on it it takes you deeper into the site, and deeper into the site, and deeper into the site. And lo and behold, there’s some learning information you can use, as well as [the fact that] you can print out these maps at any time, and with color them in. You can print out these maps and use them as a reference in a report, or have the students do multimedia reports where they can actually create almost a subset of the Web Page. I find that a very popular activity in the K-12 environment.

Something else interesting that you’ll want to keep in mind when you’re visiting these sites is to take a look, usually at the bottom of the first page somewhere — usually on the first page, but certainly on the site somewhere — is the Webmaster’s signature. And sometimes it’s simply “Webmaster at Berkeley” or something. Or it might be a person’s name. Take some time and click on those, even print them out or save them. These are people who have intimate knowledge of the particular site that you’re visiting.

For example, at South Africa you can e-mail the person that’s taking care of this site at the university site in South Africa. What better place to get more detailed information than from someone who lives there and is really intimately familiar with the knowledge that they put on the database, on the Web site? So [don’t] overlook that as a way of getting some extra information from someone who’s really involved in it.

This is the “Zoom In On Europe Site,” I call it. It’s a Europe site that is part of the Buffalo University project.

Simply click on the map and that will take you to an array of servers within that country area, and again, deeper and deeper into site [to find] maps and videos, all the color maps.

My brother was visiting Austria, and we were disappointed a little bit that we couldn’t find something that actually [was a] bed and breakfast where he was going in Austria. So at the last minute I decided to e-mail the Webmaster, and I e-mailed and said, “I can’t find anything, do you know anything?” Well, lo and behold, it was not even, I don’t know, 25 or 30 hours later, I got an e-mail back of 14 different bed and breakfasts. Not from him, but from somebody that he knew that lived across the hall or worked in the university or something that had a friend who had a friend, and we got a list of information that you just couldn’t get, up-to-date information that you couldn’t get otherwise. That’s a personal anecdote, but there are lots of others that directly relate to K-12, and again, you can get them by going deeper into these sites and finding out the people that are responsible for the site.

People that aren’t too familiar with the Internet always ask me, “What’s the language of the Internet?” And they don’t mean TCP/IP. They’re talking about “Is it English?” Well, English predominantly is what’s being used on the Internet, and of course, being “USAcentric” here, 68% of the traffic on the Internet in the world emanates from the United States. So we have

68% of the traffic; add it together with other English or predominantly English-speaking countries and you're going to get, by and large, [that] mostly English is spoken here on the Net.

There are also limitations in character representations. So if you're trying to config on the Net, you're going to have to have different software or different viewers in some cases.

Most places will put English sites on the Net. This is an exception, and this might be exactly what you're looking for if you're looking for indigenous information. If you want to look at something in Spanish, you're going to be looking for Spanish sites in this case. If you want to read about [inaudible], you're going to have to read about it in Spanish, in Español. That's the way the site is set up.

There are a number of projects that are being initiated at universities where they are actually taking foreign language sites and running them through translation software and having students that are learning that language go through and clean up the translations, and then vice versa, taking English sites and translating them into Spanish and German and French. So that becomes an extension of using the Web site in and of itself.

[There are] lots of virtual tours on-line. Anyone, anywhere, at any time can take interactive tours and again, with this new technology that's coming out that that you'll see hitting [the market] after "Internet World" — much of it was just released here — we're going to see more and more interesting things you can do with your Web browser, especially when Netscape comes out full-fledged with the inherent bugs wiped out of it.

Grand Canyon National Park was one of the first ones put on-line, and there are probably about 60 or 70 pictures and pages in this site. What a great way to just take a peek at what's going on at Grand Canyon National Park.

My wife, who's someone, believe it or not, who's not too into the Internet — she doesn't really understand it, doesn't even like to hear about it — says, "Why don't I just write away and get a pamphlet?" Well, I guess you could write away and get a pamphlet about it, but it's not going to be up-to-date information, and you're not going to be able to e-mail and have a dialogue with the person that put the pamphlet together.

Also, another thing that we're working on is special needs on the Internet. It's a book we're going to have out in the springtime. And really, when you think about it from the point of view of children being mainstreamed, inclusion is really a hot thing right now. How do you make it relevant to everyone in the classroom, or everyone that you're dealing with, or people that are [physically or mentally challenged] that are just not going to get to go to the White House, or they're not going to get to go to the Grand Canyon, at least from the East Coast here? Well, the Internet is a great way to broaden their horizons and get a look-see, a peek, into a lot of things in a more vivid way — especially in an interactive way with this new software coming out — [rather] than looking at flat, printed matter or having you just tell them about it. I really am excited about the opportunities for special-needs computing and sort of spreading the Internet down into the areas where many of these children get overlooked too much.

We cannot only hit in the United States. We've got here the *New South Polar Times*. Now, this is an Australian site, that's where it's hosted at, and these scientists are actually at the South Pole. Every two weeks or so, they say about every two weeks, they e-mail in text that is put up on a server and you can actually read the newspaper generated by the scientists. Would you like more information? Would you like to ask them a particular question? You can e-mail the scientists, they ask for your input. I guess they have a lot of time on their hands down there and they really love to get e-mail. There are several K-12 projects that have been developed around this particular site, where the classes have organized their projects dealing with these scientists — extended projects going over six weeks or so, getting information, asking questions, and actually sharing information. This is a really interesting site.

Complete Works of William Shakespeare. What's pretty interesting about this is that the way [this site is] laid out, so you can actually do keyword searching on an entire work. So if you're looking for that phrase and you can't remember where it's from, if you're a student trying to take a shortcut, you can go in and actually keyword search right to the particular phrase that you're looking for.

I sold a number of books to skeptical teachers who said, "You probably don't have something I'm interested in. Do you have anything on Shakespeare?" And, of course, we turn to page 83 of one of our books and there's a Shakespeare site, and they say, "Oh, I didn't know that was on the Internet." Someone has taken a lot of time to organize this site. There's a lot of biographical information, discussions about "Did he write this or did he not write that?" as well as the full text of all the works. And there's thousands of others like this; Shakespeare's just the more recognizable one.

[There's] a really interesting one, a labor of love by one of the scientists at NASA who's put together what's called "The Nine Planets, Two Or More, Information, And You." I don't care what you teach, there's more information about planets here than you're ever going to want to know about. It's a very, very scientific site, and yet it's designed to be very interesting to even fourth graders. And it's used quite a bit in elementary education to go take a look at the planets. It's interactive; you click on the planets, there are some QuickTime videos in there so the planets move around in projected paths and orbital paths. This is a site that also has links to current information about the Hubble Space Telescope. When the Shoemaker-Levy comet hit, this was a site that had the latest views and the QuickTime videos, and also when they have storms and different things going on in outer space. I'm not really into astronomy, but there's so much neat stuff on here that I find myself not even being so interested, but helping my son do projects using this site. We spend probably 50 minutes or maybe an hour on this site in particular, just digging out all kinds of information.

And this is a way to get students involved, rather than telling them to turn to Chapter 9 of a textbook and read it and so on and so on, and write something up. Send them to a site like this, get them interactively involved, have them download some things and have them share the information and put on their own multimedia presentation about a planet, or about the Shoemaker-Levy comet or about something else that's on this site.

Not sure about something? What to get them more involved? Ask them to put three questions together and e-mail to the gentleman that runs this site, and usually within a few days he sends an answer back to you. And there are lots and lots of related links that he's put on this site to point you in the right direction.

Again, a great government initiative for information that was hard to get otherwise is full-text searching within 24 hours of it being in the Congress. It's now available on the Internet. We can actually click on any one of these and get a list of documents, and we can actually do keyword searching and look for keywords in any document that's before the 104th Congress. In this case we put in a phrase, not just keywords, but actually English language phrases. I type in "Internet," or "telecommunications and education." Boolean [search] operators present me with a list of documents that they thought accurately matched what I was looking for, and if I click on any of these it's going to give me the full text of this.

All this [finding of] current legislation happens totally free, and it happens within, really, about 45 seconds of searching. You can get back almost anything you're looking for if it's there. This is the same information that used to cost \$60 and \$80 an hour through a commercial search firm.

But it's not all heavy-duty on the Net system. There's lightweight stuff. This is Theodore Tugboat from Canada; it's a Canadian sort of cartoon series, and it has a lot of information on here that you wouldn't expect. It's not just visiting Sesame Street and seeing the characters, it's

going into the plots and the themes behind them. You can actually join a discussion list about the plot of Theodore Tugboat. It's really a learning experience; it's structured that way. And I would like to see if Sesame Street would do something like this. I know they're working on something that's more interactive.

Global Show-and-Tell. The show-and-tell that we've all come to know and love has now hit the Internet, and it's worldwide. So it's not just kids in your class bringing in a few things they could sneak out of the house before mom caught them. My son wanted to take the dog to school, but if all the teachers allowed that, you know what would happen. But on the Internet he could put a picture of his dog up and he could talk about the things that are favorites of his.

Global Show and Tell is actually a worldwide exhibition. Students are encouraged to create art to put up specifically for this project. It could be scanned photos, it could be digital photos, it could be something from home they can bring in and work on and scan in or take a picture of; but really, it's original art that they're looking to put up.

This is from a girl named Megan in Crestwood, Kentucky. She thought that this would be something she'd like to share with the world. What's really interesting is that some of the pages have a Mail To back to them, so that the students can collect comments from other students around the [world], comments on the artwork that they put up that they want to share. It's very empowering and really, to students, if you want to instill in them a sense of self-esteem or a sense of achievement that what they're doing is noticed by others, what a great [thing] to use the Internet for, to put up something they've created — and then for them to get e-mail back from someone across town or across the world that said, "I saw your presentation, I saw your art. I liked it, I have the same hobbies as you do," is something that really builds the sense of excitement and gets them interested in using this technology for education.

There's an interactive book that's put on-line that's called *Walking in Jerusalem*. It's really neat. And it's interactive in that you can choose the chapters you go to in and out of sequence. There are a number of books like this on-line. If you've ever had choose-your-own-adventure stories... Have you seen those, where you go through a chapter and then you can decide "does the person take the right door, or the left door, or does the plane crash or not?" Many of those are on the Internet, and they're really good for creative thinking.

What's happening all the time is that we get the students interested in this and they're learning about technology. And if you believe, as I do, that it's really a global information marketplace, that we have to create information learners, then it's really lifelong learning and not just what you memorize in class. You don't finish school and then go on to real life; it's constant learning, it's lifelong learning.

Then you're going to have to believe that it's important to teach them about technology, and also to get them using technology in such a comfortable way that we think of it as the telephone, think of it as a pencil and paper, that it's just natural to use this technology. It's not something you have to gear up and do for an hour, it's just a natural part of their learning experience.

And while you're teaching them to use simple things like visiting the dinosaur page or a storybook on-line, they're using this technology, and it's starting to get inculcated so that they really feel that it's just part of the normal work flow, part of the normal learning experience. Because when they graduate, when you turn them loose out of college, when you turn them loose out of high school, they're going to have to have these information skills. They're going to have to be comfortable with it.

They're also going to have to be called what Einstein called "curiosity workers." And I believe that you really have to teach someone to be curious. "Curiosity is more important than knowledge," is what Einstein said. Because really, when you hire someone, when we hire people

to work at our office, I'm more interested or as interested in knowing that they are curious about things, especially if it's the Internet, than whether they memorized a lot of things and have a lot of facts stored, because that's static information. I [want to] know they're curious, that they love going out on the Net.

The writers we have are just gonzo about the Net. They stay late for free because they love surfing around and looking for neat things and trying to uncover neat and new sites, because they know that that's what's really going to be aiding their learning, is to find the new things that are out there. I need someone that's curious, you need someone that's curious, we need to encourage them to be curiosity seekers, and the Internet is a great way to do that.

All About Dinosaurs. [This is] a pretty interesting site, a whole Internet catalog by O'Reilly that's something they put out free on the Net, with lots and lots of resources. A few years ago, in '90, when it became more acceptable commercially to put information on from commercial providers to actually do a little bit of business on the Internet — it started probably in early '92, as some of the [AUPs] started to dissipate — O'Reilly, along with many other publishers really wondered if you could actually successfully give things away on the Internet and still have a market for your books.

There were many, many discussions, particularly in '91, '92, early '93, that this was a big, big threat to publishers. "If we put something on the Internet no one will buy our books, so let's just put an ad on the Internet and make them buy our book." Well, O'Reilly and many others have proven that it actually works the opposite. If you put the whole book on-line it seems to drive sales of the printed book. It seems a little hard to explain, but that's really the dynamics of what's happening, and O'Reilly has done a great job of disseminating information on-line.

[Here's a site from the] National Institute of Health; lots of information here, lots of data here. They have taken the approach of really telling you a lot of what's going on in life inside this site by putting in on the front page, which I think is a better way of doing it. Many sites have 65 different sentences or little phrases that are a hotlink, and you're supposed to wind your way through that. This is a pretty nice design, where they actually tell you that they have grants and contracts and scientific resources. They sort of categorize it in a hierarchy. It's pretty nice. This is their grants and contracts. Everybody's looking for money these days, and I'm sure there's a pretty interesting hit count on this page.

The Russian and East European Studies Page. I think the first time I came across this would have been in early '92; the editor has escaped me for the moment, and I don't know if it's on our card or not. You can actually get information from the East and Russian Studies Institute the next morning at 5 o'clock, and it's a compilation and a digest, a synopsis and translation into English of many of the newspapers in Eastern Europe. And that can be delivered to you by e-mail. A lot of that is now ported to the Web, so you can actually get better information on the Internet than you can get in the *New York Times*, unless you have the *International Herald Tribune* at your door the next morning.

And it really gets me ticked off when I read about people who claim that they are actually bringing a real life perspective to the Internet, and saying it's too much hype and there's nothing of value there. I just want to drive to their house and knock on their door down and say, "Listen, I want an hour of your time and really tell you what it's all about." Because there's great information on-line and a lot of it's on the Web, and what's not on the Web will be on the Web within the next eight months.

[Here's] Virtual Tourist, and don't let it fake you out. It is a virtual tourist, but it has little to do with touring as a casual tourist. It's not a travel site per se, [although] it could be used for that. But it's a great site, and if you get a little bit creative it's a great site for cross-

curriculum learning. It's a great site to find out almost anything you want to find out by going to country-specific servers.

I was in a presentation in Washington and a gentleman who has a long line of credentials, he's credentialed from here to there, actually interrupted at the end and said he really doesn't think the Internet means anything to education and he thinks it's just like the video learning that they brought out in the late '60s. The next comment was, "How do you know it's not the next laser disc, and how do you know it's not the interactive CD that was supposed to be networked that belongs to our schools," and so on and so forth.

If you came to think that of the Internet — or if you're sort of waiting for someone to come to a presentation and tell you that the Internet is the be-all and end-all that's going to solve everything, save you lots of time, present answers automatically so it's some magic crystal ball — it's not going to happen. And if you go to some presentation or a search engine and [expect to] find everything on the Internet, it's not going to happen. So if you can deal with those two things, and if you've realized intrinsically, inherently, and right out front initially that, "I'm not going to find everything that's on the Internet, I'll always miss something," and that it's not the be-all and end-all, [then] it's simply another tool, but a really neat tool, probably a better multi-faceted tool, a Swiss Army knife of a tool, then you can deal with it effectively.

But I don't want to see any of you writing articles that there's nothing good on the Internet just because you couldn't find something that afternoon or your connection went down or something, and it happens sometimes. It happens to me, and I own an Internet service provider company, and I couldn't get my e-mail for a day last week.

Clicking through gets you closer and closer, sort of zooming in on these sites. Are any of you interested, or are any of you getting close to or involved in putting up a Web site yourselves where you're actually being involved in the design of it? Quite a few, great. Okay.

It's very interesting to go out on the Internet and see what others are doing. Sometimes I wonder if that's really giving a great view, though, because just because someone is doing it doesn't mean they're doing it right. One of the books we're working on is the *HTML Mail Construction Kit*, which has several chapters in it on how to design a Web site. And you'll see — I'll make a few comments parenthetically as we go along that I personally believe are good ways to organize Net sites — but take some time and go out there and see which ones seem to be intuitively designed. Don't put the sum total of all your knowledge on the Home Page. That's been sort of an Internet sin that a lot have committed over the last year, although there are more and more books out encouraging you to have responsible Internet design, Web design, and some hints and checks on doing that. And I think you'll see the general caliber of sites actually rising quite a bit.

Here's a site where it's a little difficult to read. Their idea was that they wanted to give you a lot of sites to click from. I think it would have been better if they would have divided the companies up a little bit more so you'd have more clarity, so you could see better. But if you know generally the area you're going into you can actually get more and more information, and go deeper and deeper into this site. Off to the side they list economic tourism, news, and science, and you click on those and it takes you to sort of another level of the menu.

Oh, this is a site I recognize, this is our site, Classroom Connect on the Net. This is our site that we give away, obviously for free. We have someone working on this site full time, and basically what we do is we take much of the information that's in our newsletter and put it on the Internet and give it away for free. And it actually does drive subscriptions, because most people like to have it in their hand, delivered to them. But if you'd like to find out what's going in K-12 education, you come to this site. If you'd like to find out about educational conferences, come to this site. If you'd like to find out what our products are, come to this site.

This site also has on it something we call Classroom Web, and Classroom Web is our offer to anyone in the world: if you have a K-12 class, and you'd like to mount your pages, we will mount your pages for free.

There's another group called School Pages, I think, and they charge \$90 a month or something like that. It's quite a bit of money compared to free. And we do it for free. So you simply e-mail us; our e-mail address is on the information you have, and we will mount it for free. Now, we don't give you 10MB, we give you a few pages. But many schools are starting their own, and this is a good way to mount it. And if you told us you had 8 to 10 pages, we'd probably do that for free, too.

We have links and searches; we have search engine pages. We've basically tried to make this a one-stop shop for anyone in K-12, and we're going to gradually move to higher-ed. We are just doing a deal with a major publisher that I probably shouldn't announce yet because it's not signed until Tuesday — but a major publisher, one of the largest in the world — and they're very heavy into higher education. So we'll be [adding] more high-ed components to our site as well.

This is another with "links and searching." We've done what many others have done, and that is to afford to be able to do this and give this away for free. We're selling — providing sponsorship opportunities, is another way we call it. We're basically selling links for other commercial companies.

We try to keep it, in our case — and if you're designing a Web site you'll want to do the same thing — keep it very closely aligned to what your subject matter is, to what your audience is interested in. You won't find Midas Muffler, you won't find something that's really in-your-face advertising. What you find is a nice sort of gentle button, and it has something to do with what you're looking at. In this case it's a software company. And it's not just a software company that says, "Hey, buy your software from us." It's a software that has an amazing Web site that's fully searchable in about six different categories. So if you'd like to search for software, if you'd like to buy software, are interested in what's out there, you can put in keywords by subject category, by grade level, by Mac or Windows, or by company vendor. And so there are six different levels of searching, and it searches something like 70,000 unit databases and it comes up and gives you your choices. And you can either buy on-line or just use it for information searching.

This is one of the Pages on our Class Web. This is from Denmark, and this is what they wanted to tell us about their school. They sent us an image of their school, and there are several other images in this database. I think we put three or four Pages out for them, including information about their school and their students, just a lot of things about their area.

I would like to see them, and like to encourage them if they're developing something that's about their school, that maybe when they send up their Web Page they would include a couple of links. Maybe there's something else in their town, or something that they feel is relevant to their area. So when I go to visit their school, [I can] jump off and take a look at the Denmark server or at something else about their community. We're trying, in a long-range way, to promote the sense of community that the Web site can generate.

So it's not just about "Here's our school, this is about our students, this is about our school, and about our team," but about "This is about our school and our community." How about putting more links in about your community, even putting in, maybe, a special e-mail box if you'd like to ask questions about the community, and make it a school project where the students would be in charge of answering the questions that people from around the world would send in to inquire about their community?

Because, in a larger sense, then we'd have a world community where people from Denmark are learning about our school in Lancaster, where the students from New Jersey are

seeing this Web site on our Page and then clicking and finding out oh, here's a Denmark university server or a Denmark server about Denmark or whatever. And they can e-mail to the people responsible for that site.

Did I skip one there on zoos? Well, if you do a keyword search for "zoo," you'll come up with that Page. It's a really interesting site. And again, with these new technologies that are being announced even as we speak, you'll have lots and lots of opportunities by springtime to be able to view video clips and sound files of animals on the Web.

Web Home Room, a very nice site. This is more for those of you that are in the teaching profession that are looking for peer information, even higher-ed. And it talks about some initiatives that BBN was doing — and I forget the gentleman's name that's running this, I have talked to him a couple of times — but he has actually a lot of information on there, like why you should use the Web in education. We get a lot of criticism on that. "Oh, it's just neat technology, I don't need the kids to go on-line and look at zoos. I have a CD-ROM about zoos, or I have an encyclopedia at home."

Well, [there's] value to the WorldWide Web in education, and there's a nice paper on that at this site. I want to promote you to go to that site. Go to the Web site and get ammunition for those that you face when you're looking for funding, or when you're meeting people who don't think it's that important. Or, if you'd like just to incorporate that into something you'd like to propound, the importance of using the Web in education is a lot more than just saying, "Oh, we need an [inaudible] activity to stay up."

This site isn't very beautiful, but it's a beautiful thing. It's run by [Gleason Sackman], and it's just the richest site on K-12 Internet account activity in the country, the richest site in our country, but it's about the worldwide Internet account activity. And you click on the States, of course, and it takes you to the information. It's just pure, raw information, unlike many of the sites that we "ooh" and "aah" over. That one's value is really the pure information guide.

If you've seen anything about the Net you've probably seen the White House, and of course you can go into the secret rooms of the White House that you can't normally see, and download pictures. What I thought was pretty interesting is that they did take the step, they did a very nice job on this from day one. So the first time you went to visit this site, except for the fact that the image map was off a little bit, and [they] fixed that, is that it was really full of great information. So if you go into a room and you see a picture on the wall, you can click on it and it gives you a larger image of the picture and the history behind it. It's very interesting to see some of the in depth information that goes on behind the scenes in the White House.

There is also some stuff that we as taxpayers need to spend money on, but I heard on national public radio that they actually spend eight hours tracking Sox the Cat to get the right meow out of Sox. And if you go to the Web Page, a couple of clicks deep, there is a picture of Sox the Cat, and sure enough, just so you use the bandwidths most efficiently, you can click on that and download a file of about 110K on Sox the Cat.

Something a little more learned; [here's the] Teaching with Technology grade site. This should be in your hand-out as well. Well, [inaudible] you never see of Marilyn, and it's a very interesting site. [There's] lots and lots of information and ammunition on this site, and about teaching with technology.

That's come more and more to mean "teaching with technology." I usually say, "Oh, do you mean the Internet?" because I'm not sure anymore, because there's such a blending with using technology in the classroom and computer-mediated communication as opposed to saying, "Well, what I really meant was WorldWide Web in the class." I'm finding that in conversations, and sometimes for the first 30 seconds I'm not sure that we're talking about the same thing. But it seems to be more and more that the Internet is becoming overwhelmingly what we're talking about when we're talking about technology. And I'm not sure it's a good

thing. I'm not sure it's true in every area, but certainly in states that are 100% wired now it certainly is overtaking other sources of technology.

As many of you know, the Gopher is totally integrative, as is WAIS, and as are all the tools now with the Web browsers, so it's no trouble getting Gopher resources. And if you're into that site we talked about, Teaching with Technology, they have a Gopher menu built into the Web browser site as well.

Again, not a pretty site, this one in particular, but this is a very, very rich and robust site, and it has lots and lots of information that will scoot you all over the world, taking you to rich information sites. I believe this is the one that's at CERN.

This is the *Yahoo* page that was up the day I captured it. They've changed it a number of times. If you've read anything about it you know it's tremendously successful. [It was] started by two students, and now it's really an honest-to-goodness, wholehearted, probably heading for public stock exchange, commercial site. And still it's for free, because it's being sponsored. *Yahoo* is one my favorite sites to use, but I hear [about] many others like *Lycos* and *Excite*, and *OpenText* and more and more search engines out there. And until I actually finish reading the manuscript that we put together on searching the Internet, I guess I won't be able to clearly explain all of them.

We're doing a book on searching the Internet, explaining each of the search engines, actually going through and doing the same keyword search using each engine and comparing how it returns different sites. So don't get stuck just on *Yahoo*, don't get stuck just on *Lycos*. If you're really, really looking for information, take that extra few minutes and do a quick search of some other search engines as well. But there are several powerful ones on the Internet.

One of the things that *Yahoo* started doing, which is pretty neat, they take neat things that are happening now or today's news. There was a hurricane coming on, and they had put a Hurricane Felix hot button up in the upper left-hand corner. What they had done that morning, sort of from an editorial point of view is, "Oh, Hurricane Felix, that's a pretty hot topic today." They did a search of anything to do with that, plus sites that they knew would have information about that, and created a little index of that on a "hot page." [They] actually put the hotlinks up on Hurricane Felix so that you wouldn't have to go and sort through what they had to go and sort through. So they're putting value-add on these sites, and I think we'll see more and more of that where value-add is being put on sites, even when they're actually search-engine sites and you wouldn't think that was a natural thing to do.

So [here's some things from] weather radar on Felix from when I put this together, and we can see what Felix is up to.

The *WebCrawler*. This changed a bit after it was sold to America Online. [With it you can] conduct searches for information scattered across the world.

[One category is] English Natural Language Queries. That's a pretty large box they give you, and I've tried it out. They've put over 25 words in there, and it pulls back actually pretty, pretty accurately what I was looking for. Some of them give you a little window, but if you keep on typing generally it keeps going on, and you can get about 20 words in there.

So that's sort of where we are as far as neat things on the Internet for WorldWide Web, for treasures on the Internet, as I call it. But as far as where we're going — and really it's about content, it's not about the technology — but I want you to encourage you to do whatever you can to get the technology, get those wires everywhere, get everybody on-line. But it's really not about the technology, [even though] we have to do that first. It's about the information. But you know what? It's really not about the information. It's about the way we handle information, the way we share information. All of us can become publishers. I asked for a raise of hands and there must have been 30, 40 people in here that are involved in putting up Web sites. We're all becoming publishers in our own sense.

I was talking to the people from GNN today [about] the new software that they just started releasing a few days ago. It actually allows everyone that's a GNN — I'm not selling GNN, by the way — but everyone that has a GNN account automatically gets 20MB of space. And your mail address is simply the GNN address, slash, and whatever your user name is on GNN, which is a lot like AOL names. Which means everybody is now a publisher.

Where do you get the publishing software? GNN has it built into their software. So if you just simply click, click and log-on, and you get those first few hours for a few dollars or whatever; in their case it's 30 days free. Everybody has Web Page creation software, everybody has Web server space, bingo, just like that, for \$15 a month. Figure it out. Last year we were charging \$150 to \$300 a month for Web service base, now it's down to \$15 and \$30 from commercial service providers. This is where it's heading, folks, and it's going to be that it's not just the information, it's sharing the information, that collaborative world community that you can be a part of and encourage others to be a part of.

And it's going to be, more and more, adopted faster and faster. The change and the rate of change is actually increasing faster and cheaper with video and sound, and there's lots more. [It's a] technology-transparent medium, and that [means] it's platform-transparent. It's really about "Can you get a whole, can you use a graphical browser? Does that mean AOL? Does it mean the newest Netscape? Does it mean Netshark or some of these other neat names that are out here? If you can get to a Web browser, you can get to this information in the same graphical way.

And the emphasis really is on sharing and communicating, collaborating, and global awareness. I refer to it as the iterative learning process. If you like a constructivistic approach, I'd like to put in that text and that framework and that context so that children can go out and find the information, bring it back, and construct their knowledge by getting some of this and some of that and so on. Different methodologies. Some like to surf, some like to go in and just use text-based search engines. You get that information, you pull it together, put it into a multimedia presentation, build your own Web Page — which the students should be encouraged to do as part of a unit in your classroom — and put that Page out on the Internet.

Ask for a response, make it interactive. Don't just say, "Here's our school," or "Here's our class project," or "Here's something we've studied, we've done a unit on volcanoes," but actually encourage feedback. That's when you really get the idea of how global this is, when you start getting messages back from around the world from others that did a search on volcanoes. When your Page came up and they e-mailed you back and either added information or thanked you for sharing your information with them, all of a sudden it clicks.

And even the fifth-graders, even the third-graders get it that we're now in a global community, that this is where the technology is and it's not going to be boring, and it's not trouble to do the assignments, and it's not trouble to glean information. It's not going through the *Encyclopedia Britannica*, which is, I don't know, 30 volumes, or a 1,000-page reference book. It's instantly accessible, almost like random access. And they can be part of providing that information stream.

The Internet is a transparent medium in this way, too. Up until a few years ago it was really CD-ROM, CD-ROM, CD-ROM. Well, it's not that CD-ROMs are going away; there are more and more of them than ever. We're even producing them. But it's just that a transparent medium may not be mailing CD-ROMs to everybody who's interested. The transparent medium could be the Internet. I think it is the Internet.

In fact, the Information Superhighway from my point of view has been, since the term began being bantered around, really the Internet. And it's not what we saw last year where a lot of billions of dollars were being bantered around that this company was going to buy Bell

Atlantic, and this company is going to... I didn't ever think it was really going to be that, and wrote some articles [about how] that wasn't going to happen.

It turned out not to happen, and that is because it wasn't about the telephone companies and the cable companies getting together and creating either another network or taking over the Internet. It wasn't about AT&T subsuming the Internet, taking over the Internet so we wouldn't have control over it. It's not going to happen. And the transport medium is going to be the Internet.

AT&T just announced that their interchange service is actually going to be — they actually call it more “Web-friendly.” It's actually putting the emphasis really back over on the Internet.

And you've seen that with the commercial services such as Prodigy and America Online that the Internet is the common denominator. And those of you in higher education that have been on, maybe going back even to [Bitnet], and have used the Internet for years, know that that's really the backbone of everything that's being transported.

So we're going to see large CD-ROM repositories being transported over the Internet. You'll maybe have a CD-ROM tower, maybe a seven-disc tower at your school or at your university or at your business, and you'll be using that as a sort of very, very large hard drive. [With it] you'll actually be able to buy content from different places. There are licensing issues involved, of course, but that's the way the medium will be, CD-ROM over the Internet.

There will be no limits on database files; you can daisy-chain these things together. There's no cost to deliver updates to thousands at the same time. The technology is that you buy a CD-ROM and they don't want to hear about you complaining at static information. What you do is you hit an update button and you might subscribe; you might subscribe to a service that they provide to update it, especially if it's a news-magazine-type CD-ROM where the archive of 600-and-some megabytes is on the CD-ROM, but the updating — whether it's updating URLs in that CD-ROM or whether it's updating news and information that's ancillary to that — just subscribe to an update service and it will save that on a small portion of your hard drive, but the engine and the program and the main repository data are still in the CD-ROM. That's what you'll see.

It's starting to happen a little bit now. We're actually toying with the idea of doing the same thing, of keeping CDs updated by having you click on our server and download a small [inaudible] that actually is played by the CD-ROM software on the CD-ROM. It's more of a client/server style, which, if you've taken a deep breath and read some of the client/server magazines, and worked your way through all that terminology, you find that client/server, which is true Internet style, is now being applied to almost every other way of transporting information and having access to information. And, of course, instant updates are available.

The future of the Internet? Emphasis on publishing. Obviously the tools are almost free. If they're not free, they're almost free. And I call \$99 basically — it's not free-free, but really, if you look at some of the software that's out here it's unbelievable the things that some of the companies have done: Adobe — and I don't want to pick out too many, I'm going to miss somebody — but Adobe and SoftQuad and a number of other companies have great publishing tools. Microsoft has one out now. And these are very inexpensive in light of the fact you can publish to the world, and you pay once for a development tool and you can learn it in an afternoon or an hour and be out there publishing. I call that almost free. But there are, generally on the Internet, free tools to use.

Students find, collect, and discover information. They build their knowledge and turn around and disseminate it. And that's the iterative process that's going to be really evident in all businesses in the next number of years. Certainly by the year 2000 it's that iterative process of you going for information, taking it, massaging it, publishing it and putting it back out again. Add

value to it and charge for it, or just add value to it by putting it together and disseminating it as a part of a creative learning process. It builds esteem in global awareness. I think it's very important for students — I'm particularly talking about K-12 though it could be in higher-ed.

And there's more and more and more and more Internet. There are waves of funding coming. I know it doesn't seem like it if you're looking. I believe you mentioned to me that you were shy \$50,000 for a matching grant, so it seems like you're sitting on a dry beach. But I'm telling you there are waves and waves of money coming from corporations and from government sources, and it's starting to trickle down. Corporations are being encouraged, not only by the Federal Government, but we do it in our publications, and in business seminars I attend they're encouraged to reach out towards education.

Everybody says, "Oh, well, of course, you probably want an Apple piece of software," because I guess Apples are in schools. And it doesn't occur to them ten years later, "Why is it that Apple is in the schools? Why is it that the software companies that aren't developing Macintosh software are missing half the market in education?" It's because Apple reached out to the schools early on; they made that commitment to do that.

Do we have many business people in here that are actually running commercial enterprises? A few of you. Why is it that businesses aren't reaching out more to education? Well, in the past, quite frankly, businesses have been shunned by education. You made a foray towards the educational field and you got turned off. The first thing you said is, "Well, you probably want to sell us something. What's it going to cost us? We have no money; we can't pay for it." And education has been looked at, I'm sorry to say, from the commercial aspect as "Education wants everything for free. Let's ignore the educational market." So there's a little bit of fault on both sides. I encourage you to close that gap. The Internet is a common ground where you can agree on operating and leasing the Internet area. You can operate in an area where companies are giving huge discounts, 90% and 99% discounts to educational Internet software.

And of course, as you know from Netscape, it's 100% discounted, it's free to education, and the server software is even free now if you're certified as educational and nonprofit. So many companies are reaching closer to that, and I think in the late 90s with the Internet it's becoming more of a sort of a safe haven for everybody to meet.

Curriculum integration, living textbooks — we're working on it. I know of many other companies, McGraw Hill and Scholastic, are working on it. Why is that you turn to a chapter on history and you can finish the chapter and see nothing about on-line services, where to get information on the Internet? Why is that? Because of a long cycle of textbook adoption, Internet has only just arrived, basically. It's the oldest new technology, I call it, with the newest old technology. And the information — it's not about the technology, it's about the information — and the information has just arrived [with] 58,000-and-climbing Web sites, compared to a little over 3,000 a year ago. The information is on the Internet. Why isn't it in textbooks? Simply because of the life cycle of the adoption and printing them.

I've spoken at large businesses conferences and I've been out to talk to some big publishers, working with their Web sites, consulting and so on. They are scared, up until the last six months or so or last year, they're scared of giving too much away. In a total reversal of that, we're now seeing them actively courting Web sites, tying it into the textbooks, printing in light- blue at the end of the chapter to set it apart, "If you're looking for more information on the Civil War, here are three or four Civil War sites." Or, "Come to the McGraw Hill Classroom server, and we'll keep the links up-to-date. You type in what book you're using and type in the curriculum unit you're working on and here are up-to-date sites that have to do exactly with that." And they're realizing that the more value-add that they put into the textbooks, the more textbooks they're going to sell.

The reform? Well, I don't know too much about all the academic discussions on school reform. I know there are a lot of different camps that have been involved in many discussions, and I have lots of teachers in the family and some professors, but really, I want to set the issue of reform aside and take a look at the Internet as being a great reform tool. It's a great tool for collaborating. It's a great tool for disseminating information. It's the tool you need to wrap your arms around and embrace and do what you have to do to raise that last \$50,000 to get that plug in the library.

I think you said that if I gave you a computer, you'd have no place to plug it in. Why do we entrust our children to teachers? We expect them to teach the sum total of all knowledge to our children but we don't trust them to have a phone in the classroom. It's ridiculous. We need to work toward pushing for that kind of, actually, "low-tech."

And really, an emphasis on school-to-work. School-to-work has been taken in the past to mean teaching a little typing or some home economic skills or some welding or something and sending them out into the workplace. That's not the workplace anymore. The workplace is information technology. You have to start in third grade getting them ready for school-to-work. School-to-work is teaching them about using that technology and, from my perspective, it's teaching them how to utilize the Internet. Not just log-on, but utilize it.

Thank you very much for your attention. Our time is about up.

INTERNET VILLAGE
USING THE INTERNET FOR EDUCATION: FOCUS ON DISTANCE LEARNING



MODERATOR

Laverna Saunders

Dean of the Library and Instructional & Learning Support, Salem State College

SPEAKER

Jill Ellsworth, Ph.D.

Senior Partner, Oak Ridge Research

Laverna Saunders: [Today's speaker, Jill Ellsworth, is a] Senior Partner with the Oak Ridge Research Group, and is a consultant regarding education and business on the Internet for *Fortune 500* companies. She is also a popular speaker in North America and Europe about business and education on the Internet.

A former university professor and dean, she holds her doctorate from Syracuse University. She is the author of *Education on the Internet*, published by Simms, the *Internet Business Book*, *Marketing on the Internet*, and the *Internet Business Kit*, published by Wiley & Sons. And she was an editor of the *Internet Unleashed, Second Edition*, from Simms. She is the author of the popular on-line resource, "Dr. E's Eclectic Compendium of Electronic Resources for Distance Adult Learning." She serves on the Survey Working Group IRTF of the Internet Society, and she's an active Internet participant. She can be reached e-mail at JE, and you may want to write this down.

Jill Ellsworth: It will be at the end of my thing if anybody wants to e-mail me.

Laverna Saunders: Okay.

Jill Ellsworth: It doesn't say [it] as easily as it might, although it's located here in Boston.

Laverna Saunders: Is your Web address there?

Jill Ellsworth: Yeah, I'll have that on there, too.

Laverna Saunders: Okay. She has to leave immediately after her presentation, so she'd appreciate it if you would send any questions by e-mail.

Jill Ellsworth: Or walk with me to my next one, whatever.

Laverna Saunders: Okay.

Jill Ellsworth: Thanks very much.

Laverna Saunders: You're welcome.

Jill Ellsworth: Most people call me Jill. It beats, "Hey, you," I find. On the Internet, people are a little less formal than they are in the classroom, which I think is probably a good thing.

I'm going to talk a bit about the Internet and education, a bit about distance education and how that's growing so much, and give you some information about computer-mediated communication on the Internet and how that's impacting education as well.

The thing I have up here is just a little quote about the Internet, that it's an amazing worldwide system. Now, don't you like the chunky style it came in? I like that, about how we can reach documents, people, and so forth. Millions of people communicating. I think the two strengths of the Internet for education are in communication and in information. I call it drinking from the fire hose, because it feels like that some days.

And then I also say that I think that it may have become the best opportunity for improving education that we've had in a long time. There are a lot of reasons why I say that. I think the biggest is that we have kids who are interested now in learning how to write well, and the reason they want to do that is so they can send e-mail to people, or so they can put up a Web Page, and I think that's not a bad thing.

We also have the energized learner. The person, the kid, the adult, anyone of us — I'm called Our Lady of Perpetual Surfing by my husband. I'm the one who raised their hand if you're on all day. There's just so much information, and there are so many ways to become an energized learner on the Internet, for folks of all ages, including kids. I've seen children of a variety of ages get very excited about what they're doing on the Internet.

Recently, from North Dakota a message came to me that said, "How would you like to correspond with my 28 third-graders via e-mail?" And I thought to myself, "Do I really want to do this? Am I ready for it?" But it turned out that it was a wonderful thing to do. What I got were messages of varying lengths, some of them as little as one sentence — but a pretty good sentence — to pages and pages asking me all sorts of questions. But almost invariably the kids said, "I wrote this myself. My teacher didn't write this for me." And I think that's very important to keep in mind about the Internet. I think it is really helping literacy, too.

Let's talk about how the Internet and learning work. It's no surprise to most of you that it's a two-way communication. It can be synchronous or asynchronous, and all that means is that we can either do it at once, or we can do it in series.

It has an interesting interpersonal distance. Many of you know from trading e-mail, or working on the ListServ, or on UseNet and so forth, that there is this interpersonal distance, this coolness of environment where you can't look at someone's eyes and say, "Oh, I know they were kidding, I know they were joking." Or, "I know they said that with a sense of irony," or, "They didn't really mean it that way." And this interpersonal distance and cool of the environment can be a bit of a block to good education and learning on the Internet. It doesn't need to be, because there's ways to take care of it.

It's also characterized by not being time-reliant. I used to love getting e-mail from my students at all hours of the evening and morning when I could deal with it. I really like that. It was really nice to spend my office hours actually talking to students instead of answering the phone, because the e-mail could help me with that task.

It's not space-reliant. We all don't have to be in a room like this, together, to do education on the Internet, and I think that's a pretty powerful thing. While being in a room together does lend a certain community — there is a networking that goes on, there's a personal touch that happens — not having to be here together can also be a good thing.

We talk about education and the Internet as leveling the playing field, and by that I mean that on the Internet, you are generally taken more for who you are, or who you say you are, which can create some problems. But we're not so blocked up by issues of gender, issues of race, issues of economic status and so forth; we tend to be able, in an education environment, to take each other better at face value for what you know.

That creates some challenges, particularly for higher education professors. I used to be one, and a lot of teachers in that situation, a lot of faculty, don't always enjoy being quite so accessible or quite so easily challenged or so much a co-learner as the Internet sometimes makes us be. It does not have to be that way, but it tends to be that way.

We tend to engage on a personal level in some ways that we don't, I think, in the classroom. One of the things that I noted as a professor was that there were — and you know who these guys are — learning styles that tell us that some people learn by sitting at the back of the room. See, they're back there now. I know who they are. And they're listening, they're paying attention, but they're not your active, involved student who's sitting in the first row nodding their head and so forth. And sometimes that's real hard, because you see these people back here and you're going, "Hello!" But on the Internet some of those people who have that learning style, or that interpersonal style which is a little bit more shy, suddenly through e-mail or through Internet Relay Chat open up. You can get to them. You can reach them in a certain way that you can't reach them in person. Different people are different, different learning styles are different, and the Internet meets certain learning styles better than others.

Another thing that happens on the Internet, which is really pretty interesting, are what I call "intentional learning communities." These can be ListServes — you know, lists, the discussion lists. These can be UseNet groups, although that tends less to be there. It can be a group of people who e-mail around a certain topic. But what it means is that some of us can get together as learners and talk together about the issues that are important to us in a way that we sometimes might not passing in the hall, or doing our official things. So these intentional learning communities take all sorts of forms. But they're a little bit different on the Internet.

Learning communities can come in formal things. In higher-ed we have them, in K-12 we have them, in adult and continuing education we have them, and even in corporate training. One of the most overlooked educational activities that we have going on tends to be the corporate training angle, because it's growing at a very high rate.

And then we have the informal one, which is, of course, the Internet itself. It can be a vehicle for it, or you can do your own research. You can get to that fire hose, you can use the discussion lists. or you can find what I call "personal mentors." "Mentor" may even be too strong a word. But I've come across — oh gosh, I've been on the Net a really long time, maybe twelve years. But there are people who I can write to and exchange information with as a colleague in a way that we just simply did not do before. We've collaborated on articles — that's a kind of formal thing. But informally I'm able to say, "Listen, I've got this class, and this part of it just isn't going good, I've got this problem. Can you talk to me about it?" And the development of what I call mentors or significant other people in the field — some of them are in the field, some of them are elsewhere — but those person-to-person contacts are one of the things that the Internet does best. It keeps us in touch.

In higher-ed it's no surprise that all the major players use the Internet for a whole variety of things. Faculty has been using the Internet for a really long time in higher-ed for support for teaching, human networking, scholarship and research grants, service and jobs. Job hunting is now very popular on the Internet thanks to the "Chronicle of Higher-Ed" and a few other activities. But we're beginning to even teach courses using the Internet. We're using it to send data, using it to interact with C-U-SeeMe and other activities. That's coming a bit hard in many respects for faculty in higher-ed.

Faculty in higher-ed tend to be fairly conservative about teaching methods. Not completely, that's not a blanket statement. Since I was a faculty member, I can say that. But I found considerable resistance to using the Internet as a teaching vehicle when I was professor. My analysis of that wasn't that they didn't think it was a good idea; it's that they didn't feel that they had the skills to make it work. And none of us, not one person in this room, wants to seem stupid to their colleagues, or especially to their students. So I think it was more a case of being comfortable, of learning the skills that are needed — because there are skills that are needed — rather than a genuine resistance to it. There is some genuine resistance, but it isn't all that way.

Human networking, research and scholarship have been around a long time on the Net for people in higher-ed. [There's] lots of collaborative research, lots of collaborative writing and so forth. But the Internet recently has facilitated that a great deal more than it used to. Grant information you can find, service, jobs, and so forth. Those are traditional things for faculty.

Administrators are using it to put out all sorts of information, particularly now. There is a growing number on the Web, although higher-ed is not as "Webby" as, say, K-12, in a certain sense. Higher-ed is still a bit "Gopher-ish," but it's coming along, it's growing. Professors are putting up class schedules, syllabi, registration information, scholarship and financial aid information; [information for] alumni and parents, [and they're using it for] development, PR, all those good things including all kinds of announcements, calendars, and local area information.

One real, real heavy user of the Internet in education and administration is the folks in development and fundraising. They're real interested in reaching more and more people, and are finding that alumni and other development officers are using the Internet. So it's become a bit more popular that it used to be.

Students, of course, have their organizations. They have their career planning and placement stuff, projects and course work and research. Probably one of the most popular activities is job hunting and putting your resume on-line, on a Web Page, and all sorts of stuff like that. Organizations are using it — it's very popular. Students are beginning to use it for research, for papers, for assignments and so forth.

And one of things that a lot of people are finding is that — how do I say this nicely? Students are ripping off the Internet, and using it in student papers sometimes. And I've heard a number of complaints about that from professors. And I said, "Well, you know, it's really no different than library research. If you send a student to the library to tell you all the history of Franklin Delano Roosevelt, they can find that and give it back to you and regurgitate in the form that it came. If you will couch your questions having to do with, for example, what might FDR have thought about the Exon Amendment, then you've got a student engaged in some research and some thinking." It's just a case of how you approach it. But it has become a bit of a problem, and in K-12 as well.

In K-12, again, no surprises here. There's lots of access to information for kids and teachers, lots of collaboration among teachers and students, lots of access to software and programs and some delivery of instruction, more so in, say, Canada and Australia than in the U.S., although out West in the U.S. there is some delivery of instruction. They used to use ham radios; they used to use interactive TV and so forth, and now they're using the Internet a bit more.

And kids are publishing information. You go to Web sites for a K-12 school and you're likely to see things written by students for students, in an amazing array.

I'm from Texas, now, though I've been from Michigan and I've been from Vermont and other places. In Texas there are a number of elementary schools along the Colorado River that are collaborating — middle schools, mostly — that are collaborating on some real, actual research. That's what the students call it. They said, "No, no. This is real, actual research, this is not just stuff." The Lower Colorado River Authority handed out water-testing kits for certain pollutants and are having the kids do the testing and put their information on a Web Page, and learn how to analyze that data. They're actually applying those math skills, all those kinds of things. And the teachers are very excited about it because, as the kids say, "This is actual, real stuff." And they're proud of that. They liked the fact that it wasn't just make-work, but that someone's making use of the actual research that they've done. And these are middle school kids. And I think that the Internet has helped foster some of those relationships, especially among those rural schools. There are some that are at quite a distance.

Teachers, of course, are having a great time with professional relationships. There might be, in a given school, one math teacher of a certain kind, and he or she wants to talk to other math teachers, and has found that the Internet really helps that.

Access to information, of course, and research — those are all, again, the normal things. The human networking... I always, I always feel funny putting that up, “human networking.” As opposed to what kind? Well, as opposed to electronic. But bear with me, because I think electronic is also human.

There’s lots of curriculum development stuff out there, lots of methods, information, and lesson plans and so forth that teachers are able to trade with one another through the Internet.

This just reiterates a bit of the information about students and human networking, key pals, MUDs, access to software and access to information.

And so now we need to talk about access to the bad parts of town. The Internet, like any other large organization, thing — whatever we want to call it, organic being — has some stuff that kids ought not to have. The approach that I see successfully being used by schools is the creation of what are called “Acceptable Use Policies.”

Let’s say you have a third-grader. They’re about 8 or 9 years old. You would not take your 8 year-old, put them in your car, give them the car keys and say, “See you later.” You wouldn’t do that. You’d take them with you to look at the town, to go through the information, if you will. With the 10 year-old you might take them to specific destinations and ask them a little bit about where they’d like to go. By the time they’re 16, guess what? They want those car keys, and they want them for themselves. And the same developmental tasks exist for kids using the Internet.

Third-graders, 9 year-olds, need a lot more supervision about where are safe places to go. They need an adult there with them on the trip, making sure that they don’t get into the bad part of town. Ten or eleven year-olds you give a little more freedom to, but you still monitor what they’re up to. You give them destinations, use some of the tools available to you, like *NetNanny* and others, to change the access and so forth. That works pretty well up until 13-ish, 14-ish, because those kids are real smart about how to download another copy of *Netscape*. They’re not stupid. They know where to do this, they know how to do this. And they know where to find stuff.

I asked my husband about kids, and when he was kid what sort of material he got a hold of that maybe he shouldn’t have. And he said a paper boy and he would meet early in the morning at the fire hall before their manager came to give them the papers, and they would arrive plenty early. And do you know why they would arrive plenty early? There were *Playboy* magazines there to be had. His mom found out about it — he was 14 at the time — and she took that opportunity to say, “Here’s some appropriate behavior. You’re not going to do this anymore. Here’s how you’re going to do it.” She took it as an educational task.

And I think that when we think about appropriate materials for kids we need to think about level, we need to think about access, and we need to think about adult supervision. Kids, 10 year-old kids, it seems to me, should not be turned loose with a tool as powerful as a computer without checking on them from time to time about what they’re up to. Is your 12 year-old spending all day in his or her room, doing stuff you don’t know about? Well, I think we better look at it.

At school the schools have acceptable use policies that the parents and the children of a certain age sign together, and it talks about the logical consequences. I think that it’s impossible to imagine a system — well, there’s probably vendors in this room who would disagree with me — but I think it’s just about impossible to imagine that there’s a way to keep all children from materials that all adults agree are not okay. I mean, there’s a picture of Michelangelo’s

“David.” Well, it’s a naked man, but it’s art, so it’s probably age-appropriate for a certain group, but certainly not for others. So I think that it’s an education thing, and appropriate use policies need to be used. So, stepping off of my box...

The projects that are going on in higher-ed and in K-12 on the Internet can be usually categorized by a couple of different things. Maybe they’re person-to-person; that would be an individual to an individual, and that would be kind of a mentoring situation. A person-to-many is the way that the children interacted with me with their e-mail. Many-to-many, classroom-to-classroom, groups-to-groups, groups of students-to-groups of students, one person-to-many in a distribution. Computer-to-person — a little CAI, and so forth, using the computer as a tool. Computer-to-computer, and we set it running.

One of the interesting new things happening in education and on the Net in general is the degree to which the computer, the network, interacts with us as opposed to the other way around. We’re beginning to see search boxes and things like that where we can give it instructions, and it goes out to fetch and comes back and we interact: “Well, I really like this, but I really didn’t like that.” It’s getting very interesting. And you’re seeing projects of all kinds in education, at all levels.

Distance learning is, of course, one of the ways that education is using the Internet. It’s high-speed; even if you have a 2400-baud modem it’s still pretty high-speed compared with going to a place. The Net is not time-and space-reliant. It has the characteristics of both linear learning and nonlinear learning. By linear learning I mean first we learn this, then we read this, then we learn this, and then we read this, and so forth. We go it through it the way, in general, the professor or the teacher has organized the material. “I want you to do it this way,” and we go through it. As educators we’re very used to that.

With HTML and Web Pages, and all the interactive media going on both on and off the Internet, actually we’re beginning to have to deal with nonlinear learning. A person can jump in in the middle, a person can choose to skip something, a person can choose to ignore something or a person can choose to come in at the end and work their way forward. All sorts of things like that. It has great, great educational opportunities and liabilities both, because we like to think about knowledge organized linearly, and it’s pretty much of a problem for some folks.

When you talk about distance learning, you begin to talk about some of the needs that are present with distance learning that are present in other learning situations, but they’re present in different ways. When we interact over the Internet at great distance from one another, we have a lot of getting to know one another and forming a community is harder. We don’t see that face. We can’t sit and talk before class, or after class go out for coffee, or meet with one another informally and get to know each other. The Internet makes that a little bit harder.

One of the ways we’re approaching that is through trading pictures, GIFs and so forth. Trading URLs for personal Pages that tells all about your cat or your friend, and so forth. Again, fleshing out that person. But distance learning on the Internet has that problem.

Fostering the atmosphere of learning is also a challenge. In a classroom or a situation like this, we’ve set it up kind of formally. We know I’m talking to you. Lots of you are listening, and you’ll have questions later. But on the Internet we don’t have that atmosphere of learning, and you have to begin to foster it through maybe formal introductions, or ways of going around the virtual classroom together.

We also lack those contractual systems of a classroom. We don’t have the trappings and the formalities and so forth, so all of those things begin to be challenges when we talk about needs regarding distance learning on the Internet.

Here’s one of the other things that I find is a problem, no matter what level of education you’re doing. You get closure in a lot of different ways; sometimes closure for a class,

sometimes closure for a lesson. On the Internet, I have observed that it is the case that we have our formal class, but then we don't get the same kind of closure because people want to still e-mail with you. They've built that community, and there's a greater flow of not wanting to let go of those virtual friends. You see that in — I don't mean in real life, but off-line as well — you know, the party after class and so forth.

But e-mail really facilitates that hanging on together, which is not a bad thing. It's simply harder to get learning closure, that's all that is. And it's just something you pay attention to when you're designing distance learning things.

There's a lot of literature, a lot of stuff out there about computer-mediated communication. And that's what we do when we do the Internet. We have the computer, in a sense, assisting us in our communication and so forth. And the most powerful thing that seems to go on is this human-to-human [interaction]. I think that's one of the things the Internet is best at. The human-to-human can be, in distance learning, a bit exclusionary; that is to say, if we're doing a lot of back-channel e-mail instead of in our formal virtual classroom, people will have the feeling that something's going on they don't know about. Now, that can also happen with a regular classroom with office visits, but e-mail tends to be a great deal less formal than a meeting face-to-face between a professor, let's say, and a student. It tends to foster that person-to-person lack of formality that some people find difficult. But it's part of the human-to-human using this computer to facilitate the instruction. The person-to-person part is very rich, but it can be a little uncomfortable for some.

Then we have the huge area of information retrieval. And there are issues around this, particularly — it's always been true — some of the things I'll tell you about have always been true, but they're even more true on the Internet. Let's suppose you go to a site and you find lots of great information on — I'll use good old FDR again, Franklin Delano Roosevelt. Well, you look at the information and you say to yourself, "Well, gee, who wrote this? I don't know that person. Who are they? Do they know anything about Franklin Delano Roosevelt? How permanent is that information?"

Well, I can tell you, in a lot of cases it's not all that permanent. Could someone change the information? Sure, it happens all the time. So immediately you are in the driver's seat of trying to figure out what good information is. Where did it come from? It's history.

And on the Internet — lots of people are working on this — but you fill tons of information that you won't know the source of, you won't know the reliability of, you won't know who wrote it. And so it becomes of dubious value to you. Finding good information, valuable information, requires that we know who wrote it and know something about that person. What are their credentials? Maybe they're not formal credentials, because I'm not hung up on having — that the only way you know something is if you have a Ph.D. after your name, I can assure you. But we need to know that this person knew something about this, and that the facts are right, and so forth. It's a real issue, and it's not going away.

Also, I do my "Dr. E's Eclectic Compendium of Electronic Resources for Lifelong and Adult Learning," and on that I say, "copyrighted, it's mine." You can reprint it, you can hand it out to people. But you can't make any money off of it. I'm not, so you can't. But you can use it pretty much any way you want, as long as my copyright notice and my name appear with it.

Well, guess what, folks. I find it all over the Internet without my name on it. Somebody took it, and that's bad. I think to myself, "Well, you know, they're just ignorant or something, I don't know." I'm annoyed, but I don't really much get cranked about it. Occasionally I'll write a site owner and say, "Hey, here's the official version." But then you know what I find? I'll find it with someone else's name on it. I get a little ticked off about that one. Or worse — to me, even worse than that — I'll find it with errors introduced into it that I did not put there, but my name is still there.

Those are all issues about this whole thing of information maintenance and retrieval. How can we maintain the quality of our information and the whole thing going on about intellectual property? The minute you write or create something, it's copyrighted. It's yours. No one else may use it. You do not have to register it with the Copyright Office, although doing so offers you some additional protections if you choose to litigate. It's yours. Just because you found it on the Internet does not mean it is in the public domain, it does not mean that it does not belong to someone. So be very careful about that snuffing down of information without thinking about who's copyright it is.

Then we have the whole issue of computer-assisted instruction. And we're beginning to see some really fairly nifty on-line things; I found some very nifty tutorials, especially in some of the sciences and math areas. I think you're going to see more of that. Because what it means is, if I've created the educational materials once for my classroom, if I'll put it on-line, other people can use it, other professors, other teachers can use it, other students can have it. But again, it gets back to that quality of information. So it's something that's an issue we really need to think about.

Here's something I discovered in my travels teaching the use of the Internet. And that is that in fact, when we begin to teach using the Internet, there are several levels of learning. And I find that the levels of learning work as well with adults as it does with kids. We just adjust it a little bit.

The first level has to include all the information on why we are doing this thing. Why are we doing this? What's the context? What's the groundwork you have to lay? When I first started using the Internet to teach I was teaching oh, one of those very popular courses for graduates, the required Research and Statistics course. Talk about your popular person... although, usually by the end it was all right. But at the beginning we had a lot of this: "Yeah, show me." And I found that in that teaching, because I made them learn to use the Internet — and the word "made" is the key word, forced — the first couple times I did this, I didn't spend nearly enough time setting the context, letting them know why we were doing this so that they could understand what the tasks were to be accomplished. So level one learning says, "Why are we doing this? What's the context? What's the ground work? What are we up to here, guys?"

The second level is sheer mastery, sheer learning of the technology, the processes, the operations and so forth. I can assure you that folks who have not been on the Internet find signing on, getting their password, getting their user name, getting all that stuff together, much less learning how to use WinSock, if we're doing that, is very daunting. And unless we solve the problem of, "I can sit down at the computer. I am not going to break it. I can get on-line, and I feel comfortable about that," I can assure you that the rest of the learning doesn't happen. If I don't feel comfortable getting on-line, learning how to do that with the passwords or whatever it is, getting my mail, all those routine things — if you're a real regular Internet user as most of you are, it seems like a no-brainer. But it isn't; it isn't a no-brainer until you've accomplished the task.

Level three is then mastering the tools. "I'm proficient with it. It's easy." All that means is that we've made it easy. We've learned to do some searching, we've learned what the difference is between Telnet and FTP. We've learned that a GUI makes all that easy, and I don't have to worry about it anymore. Familiarity — it's like sitting down at a computer, turning it on and booting up *Word* for Windows or whatever platform you're currently using; it's a tool, that's all it is. It's easy. The Internet becomes a tool. It's easy.

Then we can really go into level four where we can use this application, and let's call the Internet for a moment an application in education to problem-solving. We can actually use it. We can meet challenges. We can solve problems. We can do our homework. We can engage

in chat. We can post our work so others may critique it. We may then download it and get it off of wherever we've got it so that we can do it.

One of the things that I decided early on to do that I felt the Internet really facilitated was when I asked my students to post research reports of articles. They were analyzing the articles for the kind of research method that was used and so forth, and I asked them to post that on-line. Then everybody else in our class could look at it, read it, download it if they wanted to, make critiques of it and get back to the person through e-mail. My students lived, in some cases, eight to ten hours from the university, so this worked well for them. They got their critique, but they had to learn how to get that off the Net and re-write and re-post and so forth.

This had two purposes. One is that I found that after the critiquing, the quality of the writing was quite a lot better, especially after they got used to the process. They didn't want to post things that weren't quite so good. They needed less critiquing towards the end of the semester. And they also developed skills using the Internet for research and so forth.

Level four is where we want people to be, but in all learning situations, unless we've gone through the rest of it, getting someone to actually use the Internet for problem solving, for searching and for meeting various business challenges or business case challenges, I found it didn't work very well at all. I tended to rush it. So after a semester of great frustration on their part and mine, we came to a meeting of the minds whereby I improved my methods. And each time that I've done it since then, I've learned a lot about how to help people do it. And I look back at my first semester and I go, "Well, that was terrific. How not to do things."

What I want to do is I want to work with this group a little bit, and my address and stuff is up there, but that's not what's important on this slide, it's just that I'm at the end of my slides for the moment.

How many of you are educators right now? How many of you use the Internet in any way? What is the worst problem you have with that? Anybody willing to stand up and let us talk about you and your Internet thing a little bit? You're willing? Good. Thanks.

M: [inaudible] not being able to save either e-mail, or network problems, server fees...

Jill Ellsworth: Ah.

M: Or my computer doesn't work or it's too slow.

Jill Ellsworth: Okay.

M: [inaudible]

Jill Ellsworth: Would you characterize those as technology problems or hardware, software problems? Or is that their way of telling you, "I'm having trouble?" I don't know. I'm just asking.

M: [inaudible]

Jill Ellsworth: Frustration?

M: Yes.

Jill Ellsworth: Anybody else have anything similar to that?

M: Over here.

Jill Ellsworth: Yes.

W: [inaudible]

Jill Ellsworth: All right.

W: [inaudible] the biggest problem on our campus.

Jill Ellsworth: Mm.

W: [inaudible]

Jill Ellsworth: Okay.

W: They're having a real problem, they're not [inaudible].

Jill Ellsworth: Right. I think that certainly echoes some of the problems that I've seen at my former institution. And it centered around two parts of this; one was access, and by that what they meant was dial-in so forth. And then, "It's too slow. It doesn't work the way that I thought it did."

There's a couple of ways that institutions are addressing some of this, I would say not perfectly.

Let's take this example here. One of the things that feels so frustrating in these situations is that there's a perception, and I don't think they're wrong, that no one's listening to their complaints. And many institutions have, because of this problem, instituted a formal process whereby we can find out what those problems are. When are they occurring? What is the access problem? And I'd very much encourage you to get students to help you document those things, because having been on the other end of technical problems in a former life, if you don't know they're going on, you can't fix them. That's true. But even when you know that there are problems, it's this diffuse problem thing that's not helpful.

One of the things that I really found that worked for some institutions is the creation of formal feedback to the "sysgods," whoever they are. I always call them the sysgods because that's who they are for me. Formal feedback. And this works as well in K-12 as anywhere else, to document all of that. Now, the problem then becomes — she's right. Certain times of the evening, those students cannot get in. What are alternatives?

And I'll tell you that the ones that I've suggested are not institutional solutions. They tend to be things like students getting together and getting an account on an ISP and forwarding their mail, being able to use a different system. It's not perfect. That's not a great solution. But sometimes it's the only thing that works. Some of my students got together and got a AOL account that they could work their e-mail from. Others got access from an ISP. Those are not the only solutions, but I find that where institutions are willing, let's try to help them.

Document what's going on, then they can at least take a stab at solving it.

What other problems do you notice when you're trying to use the Internet for education? What other kinds of things? Yes?

W: Well, actually I have, I work with [inaudible]. And I found that [inaudible]

Jill Ellsworth: Yes.

W: [inaudible]

Jill Ellsworth: No, they don't.

W: [inaudible]

Jill Ellsworth: Right. For those of you who can't hear, she's relating that faculty typically won't come to the training that's offered. They're hesitant about using it because they don't know what's going on. Anybody else have that one? Yeah. Look at all of these hands. Do you want to tell me a little bit?

W: [inaudible] very much the same way.

Jill Ellsworth: Yes, it does.

W: [inaudible] and a lot of isolated individuals. However, the upper management is a little older and more conventional and more reluctant, [inaudible] individuals trained and eventually momentum builds. Because the manager's got to find out what they're doing.

Jill Ellsworth: That's right. There's the need to know. I think that those are very common problems in education and in business, and I'll tell you what I observe. I observed exactly the same problem. The folks in charge of the computer center or wherever, IS people in business, whatever we want to call them, would arrange these terrific training sessions. "Next week at 2:00, be there, you're going to learn everything you ever wanted to know." And it went over like a lead balloon. As I observed this, one of the biggest reasons is that people, particularly faculty, don't want to go to that kind of session because they feel dumb. "Oh, everybody knows I don't know."

What I found works much better is a one-to-one, I'll call it a "mentoring" situation. You're assigned to someone who does know. I mean, I used to get these approaches of "Hey, buddy, you want to buy a watch?" out in the parking lot. People would say, "You know about the Internet, don't you? Would you tell me a couple of things?" It was easier one-on-one, you know, almost covert.

I do find that in those situations that managers or faculty — and there are some similarities between those two groups — react much better to knowing one person that they can talk to, that they can call, that they can network with, either informally or formally, because they feel safer in that situation.

Also a lot of faculty, a lot of educators, are self-propelled learners. They will learn a lot on their own, but they need to know some starting places and they need to know somebody who will answer that one question. I remember this, "Oh, cool, I got all signed on and I'm on-line, and there's this dollar sign prompt — now what do I do to get my mail?" I mean, it sounds so stupid, but I didn't know what to do. This was years ago. When I called the person they said, "Type mail." I went, "Okay." Then I did, and there I found it. But it was the one-on-one. I find that faculty, middle managers, CEOs, do not generally react well to group situations, because it's that self-revelation. "Oh, I'm revealing to you that I don't know. People are going to think I'm real stupid." And they really hate that. They really hate that. So that's just something I have found that works. And there's some research on that in the training research, the IT research, that supports that one-on-one approach.

What other things have you found that are troubling — or maybe nothing? Yes.

M: Maybe you could repeat the question after I finish this.

Jill Ellsworth: Okay.

M: I notice you use the word education.

Jill Ellsworth: Yeah.

M: And sometimes you use the word [inaudible].

Jill Ellsworth: Yeah.

M: Training perhaps. But I'd like to address the political question underlying some of this, that it seems that a bunch of people in the education business feel that computers are being imposed upon them as a way of saving money.

Jill Ellsworth: Yes.

M: And I'd like you to address the possibility of rebellions, like the...

Jill Ellsworth: Oh, like in Maine.

M: The college professors in Maine.

Jill Ellsworth: Yeah.

M: Who were forced to broadcast over the television...

Jill Ellsworth: Right.

M: [inaudible]

Jill Ellsworth: Right.

M: They resisted that.

Jill Ellsworth: Sure.

M: Technology can perhaps help them to save money, but when it becomes less of a tool for people to stage mail or to do this, their course plans and that sort of thing, it actually becomes some way of computerizing education, then [inaudible].

Jill Ellsworth: Okay. The question has to do with the ways — and I'm going to re-phrase it, because that's how I always do it. And I'm going to take higher-ed as a way of talking about this.

In higher-ed, in many institutions right now, faculty are under huge pressure for the public to know what in the heck it is that they do with their time, and to be more productive — ah, that famous "more productive." How can faculty be more productive? "Well, if we could

only get them to use the Internet and distance education, one professor can then teach five hundred or five thousand students instead of twenty. What a great idea.”

Now let’s talk about where faculty are right now. They’re under a lot of pressure. There are a lot of cut-backs. Part-time faculty are taking over full-time slots. We’re not replacing faculty. All those things are happening, and we are then trying to “foist” — that’s a word I’ll use — onto faculty technological fixes for becoming more productive. And one of the biggest ways is through distance learning.

There are many, many instances recently of faculty rebelling and saying, “No, I’m going to teach twenty students. I’m going to teach them in this room, and I’m going to teach them this way. That’s academic freedom, and I’m going to choose that. I am not going to teach five hundred students via TV or via the Internet.”

So the technology becomes the devil. The technology becomes the bad guy, the guy that we need to worry about, and becomes the focus of the issues instead of the issues becoming the issues. And I find this very, very common in higher-ed right now because faculty are being re-trenched, they’re being cut back, they’re being told to be more productive. And the answer — I used to be an administrator so I can walk the other side of the fence and said, “Yeah, let’s get those faculty to be more productive. What are they doing with their time, for God’s sakes? This is cost effective. Let’s use it.” Ooh, cost effective.

So I think in education, particularly higher-ed, we need to — but this is true in K-12 as well. As you know, some of the issues in K-12 have to do with class size and effectiveness, and class size as a measure of effectiveness; and where technology becomes the bad guy, the devil, is where I think it allows us to ignore the actual issues. The actual issues are, what are faculty doing with their time? Teaching nine hours a semester doesn’t sound like a lot to most people. What are you doing with the rest of your time? What are you doing with students? What is effective teaching, and so forth? And faculty are being forced into using technologies, and I think that’s another reason why we’re seeing some faculty saying, “No, I’m not going to that training, because if I learn how to do that, then I’ll have to do it.” I don’t think they’re wrong sometimes about that. I don’t think they’re wrong.

[Thank you for coming].

INTERNET VILLAGE USING GROUPWARE ON THE NET: TIPS, TRAPS AND TRAINING



MODERATOR

Laverna Saunders

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SPEAKER

Marsha Woodbury, Ph.D.

Associate Director of Education, Sloan Center for Asynchronous Learning Environments (SCALE), University of Illinois, Urbana-Champaign (UIUC)

Laverna Saunders: Welcome to happy hour in the Internet Village.

Our last speaker today is Dr. Marsha Woodbury, who is from the University of Illinois at Urbana-Champaign, where she is the Associate Director for Education at the Sloan Center for Asynchronous Learning Environments. The acronym is SCALE, S-C-A-L-E. She's also on the National Board of Computer Professionals for Social Responsibility. She graduated from Stanford — so long ago that she won't say when. Then she and her husband emigrated to New Zealand, where they have lived for 18 years. So we have a global expert here.

She has a Doctorate in Computer-Aided Instruction from the College of Education at the University of Illinois, at Urbana-Champaign, as well as a Master's degree in Journalism. She is the moderator of CPSR Global ListServ, a discussion about worldwide ramifications of the Net, which has over a thousand subscribers from all over the globe. If you want to communicate with Marsha after her presentation, her e-mail is — marsha-w@uiuc.edu.

Marsha Woodbury: Here, I'll put it up there.

Laverna Saunders: Okay. There. And her presentation today is "Using Groupware on the Net: Tips, Traps and Training." Thank you, Marsha.

Marsha Woodbury: I admire you very much for sticking around at this hour. I think that's wonderful that you are so good. You're good citizens of the Net if you stick around for the four o'clock presentation. I really appreciate seeing you.

I'd like to walk around down below but I can't handle all the technology that well, so I'll stay up here. I always believe in giving a little bit of an idea of what I'm going to talk about before I start, since some of you might have to leave early and you'll wonder what you missed.

I'm going to talk to you a little bit about our project, how it came to be and what we do. I'm going to give you quite a bit about what we're learning and a little bit, at the end, of talk about the future. So I apologize to those of you who are behind a pillar, as I was earlier today. If you want to move to a more comfortable place, please do; but I'm stuck here.

What I'm showing you now is a networking module, giving you a little bit of an idea of what we're going to talk about. We're going to talk about resources on the WorldWide Web and electronic conferencing.

Networking is the key of what we do. The information superhighway may be mostly hype today, but it is an understatement about tomorrow. We were just talking up here on the stage about it. Just a couple of years ago, if you went to a Mecklermedia's Internet World, you would have had no trouble getting in or registering or seeing the vendors; whereas today the people are lining up out on the sidewalks and you have to wait to register. The interest is just growing like crazy, and it certainly is with education.

The project that I'm on is called SCALE, which stands for the Sloan Center for Asynchronous Learning Networks — except that last thing we changed to “environments” because it would have been SCALN. We didn't like the sound of that, so we changed it to SCALE.

SCALE came from a grant from the Alfred Sloan Foundation, so if you're looking for some soft money, here's the place to do so. You can e-mail me and I can give you this URL. They are funding different experiments with Asynchronous Learning Networks. They're funding three different categories of projects. The first is using asynchronous learning; that is, I'm at one place sending a message, [which] you read at a different time. Not at the same time — asynchronous. This is used effectively on or near a campus.

The second project, the second category is for those within commuting distance of the campus. And then the third is very far or distant-ed. The main thrust of what we're doing this year is in the yellow circle [on the projection screen], the “on or near campus.”

SCALE began with a grant from the Alfred Sloan Foundation in October of 1993. That was just for an experimental class, and the idea was to investigate the value of these learning networks. The goals of these grants — and particularly in our case — were to provide a test of the value of these courses on a campus, not away from the campus but on a campus. Then, if we found some successful techniques we were going to disseminate our approach to other universities.

Also, we were going to measure three things. We were going to measure retention — that is, how many students dropped the class after a certain amount of time. One of our problems was in the time [it takes to get a] degree, we want students to move through as quickly as possible. When they drop a class, they lose time. So we are measuring how many drop the class.

And as the previous speaker [Jill Ellsworth] said, we are very much interested in efficient use of faculty time. This is a Sloan idea; it's not particularly my idea. But they wanted to see if they could make faculty time be used economically.

Then we wanted to measure the quality of student learning. Now, how do you measure that? That's a pretty tough one. But what we did in the initial stages was measure the classes that used asynchronous learning against the classes that hadn't on the same [basis] — tests and courses. Lo and behold, the students that used these technologies did better. [This is from the] preliminary results from the other Sloan grants all over the country; from Stanford to New York, all over, we're finding success in this realm.

Now, whether or not this is efficiently using professors' time is another story; it may actually be taking more time than they ever spent before. [I see] nodding in the front row. But we are finding some good results with learning. And I think the reason is, and maybe we need to talk about this, is that it's a very active learning.

So the key trend now with technology in education is moving from the classroom to access anytime, anywhere. That is the asynchronous learning model. We are moving away from the lecture presentation — the sage on the stage — to interactivity and active learning, where you are more of a participant in the process.

I like to think of the teacher as not the sage on the stage but the guide on the side — you know, helping the students in their learning but not being the font of all knowledge. We're moving from paper resources to digital, and we're putting our syllabuses on-line. We're putting our readings on-line, and we're getting away from paper.

As someone said the other day, that's one less excuse the student can use for missing a class. They can't say, “Oh, I lost my syllabus,” because you can say the syllabus is on-line. Also,

with asynchronous learning there is a little bit more of a chance for self-paced learning, for taking as long as you want and repeating exercises over and over again till you get them right. That is the old computer-aided construction model, but we're using that, as I'll show you later.

So our project, the SCALE project, is using four kinds of asynchronous learning. We are using specialized, stand-alone software. One of the products that we use is called *Circuit Tutor*. That is a strictly the most basic kind of learning you've ever done. It's routine; you get a question, you put an answer to it, and then if it's wrong a little message comes back that says "you're wrong," and you can ask for help. It's totally you and the computer. This is not on the network, this is just you in a room with a computer. Stand-alone software.

We're using conferencing, and I've promised to define what groupware is — it is a conferencing software where the students and the class can all talk to one another. We are putting course materials on the Web.

The last thing that we are doing, and probably the most exciting in the long term, is that we are doing these — I may have this wrong — CGI, computer-generated interface, where we are having the students write in their answers to the computer at a distance. You know, instead of the stand-alone software where you write in a practice answer, you actually write it into the Web and then get an answer back from a remote server on the Web.

This is very exciting because now we can get out of that model with just one person with the software alone in a room. We can move this out and make it accessible to hundreds and hundreds of students. So this is a pretty exciting development.

So what are we using? Well, we're using servers and Mac and PC clients and modems, and we're having a lot of students hooking in at night from their apartments and homes. As far as software, we're using groupware tools. Now, the ones that you may most likely have heard of is *Lotus Notes*, but we're not really using that in this project; we're using one called *First Class*, which I'll show you in a minute. And *Pacer Forum*.

Groupware are products that allow people to collaborate; they are one step beyond ListSrvs. Everybody sees what everyone else writes, up to a point — although you can divide off into groups where no one else can go in except for the people in that group. And it's pretty exciting stuff. We use Web browsers; we use *Netscape* and *Mosaic*. We use the stand-alone software like *Circuit Tutor* and we use things like *Acrobat* to distill documents so that they can be read both on Macintosh and on PC computers.

We are serving the residence halls on campus, and if we have to coordinate all these people we have to get them all to agree. It's not always easy; one of the problems we have at the University of Illinois is that we have about 37,000 students now and we have a lot of very independent-minded people. So getting people to agree on what the students see when they walk into the lab is something that we can't dictate from the top.

Somebody may not choose to call the communications software "communications," they might want to call it something else. We've been — for some reason, they settled on "Network Services," so all over campus if you want to use communications software you find it in Network Services.

So we have to, as I say, try to get everyone to work together. Students are using their apartments and homes, and our professors are using their offices. They're working from home or they are working from distant locations, and they can check in to their classes if they are in London or Paris or back on campus.

Our goal is to use groupware appropriately. Simply throwing technology at a problem usually doesn't work and will probably make a big mess; and I kind of agree with that. So we

are trying to find the right use for this product. Just to repeat myself, the asynchronous conferencing allows the student to decide when they want to work.

At our campus, and maybe at yours, we have a lot of students who have to hold down jobs, so they are going to maybe even two jobs to get through school. They log in at midnight, they log in at 9:00 in the morning, 3:00 in the morning — they choose when they are going to participate. We are trying to build a sense of community in large classes; at the University of Illinois we have a lot of large classes. A class of 500 students would not be that strange. We try to break it up and divide into small communities within that class, so that the students don't feel so isolated.

The students are reporting that they feel that they have more access now to TAs and faculty than they did before; but then we get back to the earlier question of whether the faculty has less time. At the SCALE project we have around 3,000 students on-line in just this first semester, and during the fall of 1995 we have had 40 classes in seven different colleges that are on-line. So we have a pretty big project going.

First Class is a software that looks like this — and I do not know if Soft Arc is out there showing this today — but this is the vendor that has made *First Class* available. It's used by business, and that is maybe a problem, maybe not, we can look at that later. It's built very much on an e-mail model, and each of the little envelopes down there with a line is an e-mail message. Above the horizontal line are conference areas. Just to read those out for you, one of them is about basic concepts and one is on resistance circuits. So this teacher has decided to divide the class up by chapters.

Pacer Forum, on the other hand, is a lot more colorful. If it takes a student 15 minutes to learn how to use *First Class*, it takes them practically no time to learn *Pacer*. It's very easy to learn, it's very colorful and inviting. It has one major drawback, and that is it's a Mac client, and they don't have a PC client right now. So although we all have found some advantages with *Pacer*, very few of our faculty are really using it because of that limitation, because access is a big problem.

But as you can see, there's a lot more of a graphical use in *Pacer*. You can use this software to send out course updates, and it will be read by the whole class. For the first exam, maybe the room has been changed — you can send colorful messages in any color and font you choose. This message is in blue, but it just as easily could be in red or magenta. It's a lot of fun.

We have what we call "virtual assistance" — that is, we check in very often to see what the students write in. This student is using *Pacer Forum* and has written in a message including a picture and sound. Of course, it's really my boss who wrote the letter, but he signed himself in as "Chris Student." And he says, "Hi, everybody, I can't figure out how to solve problem 3.5. I'm attaching a picture with a circuit and three equations I wrote. Also a sound file."

So then the TA looks at the picture and says, "Well, I can see what's wrong with that," and the TA circles what's wrong and sends the picture back. Now, in the old days, if you're working on your homework on a Friday night, you wouldn't get back to your teacher until Monday, Tuesday or Wednesday of the next week. But we check in often, and that includes weekends. We can give the students feedback right away, so it's a very timely way of learning. It's very efficient.

In *First Class* you don't even have to have a little embedded picture, you can actually send the picture so it can read right there with the text. So it's even more user-friendly.

We have a simulation that's going on that's kind of fun. At the Vet College the teacher puts his students on-line in groups of five, and they have a simulation: they have a disease breaking out on a farm and the students have to track down what that disease is. They have to order tests, they have to ask questions. "Has the herd been moved lately? How has the weather been? What have they been eating?" Those sorts of questions.

They have to do the whole exercise on-line, and every question that they ask and every test they ask for is logged by the professor so he can compare one group to the next. This got so fascinating for local vets that they joined in, too. It's now kind of a fun hobby. Everybody tries to participate in the disease breakout, whatever it is. They can actually measure how much it costs for them to track down the disease, how long it took them to get to it and get back.

I asked him, "Well, how do you have these groups use the computer?" And he said, "Well, they might have one person at the keyboard and they are all standing around doing group think together, and they have to use the computer even though they are all students on the campus."

Just to give you an idea of what it's like — this is an administrator's nightmare, but this is what I see. These are all the classes, just on one of our servers. We have two main servers just for First Class this fall, so you can see that I could never in a million years keep up with all the conversations in all these classes. But these are everything from Comparative Lit to Agriculture 100, Economics, Chemistry, Urban Planning, Sociology... It's been used all across campus.

My job — and that's why the talk was titled [as such] — had the title of training, but I was hired to help train people and I have to train faculty, teaching assistants and students. As you can imagine, I have three very different populations to train. The faculty have the problems of that we were discussing earlier — reluctance to expose their ignorance and so forth.

I have found that one-on-one does work best. I visit their offices quite frequently and try to get them set up there, and they are very enthusiastic and very creative; I couldn't even think of half the things they do for what to do with students. With the teaching assistants, some are very motivated, some just call it a job; they log in and do it and leave. So we have a varying degree of enthusiasm.

The students also have mixed ideas because they were not informed about this before they signed up for some of the classes. They thought they were just taking another section of Comparative Literature and found out they had to do asynchronous learning as part of the course; so some of them were a little shocked.

We approach it through workshops. For faculty we hold seminars for the campus and lunch discussions. I do the office visits. I do a million demonstrations. Then we do tutorials — I see a misspelling — created for access on the Web. The tutorials are like a *First Class* manual that's out there on the Web, and I'll show you a picture of it in a minute.

I am learning, after my first semester, that hands-on training for the students would have been very much better than any of the demonstrations I did. I mean, I might feel very important if I'm doing a demonstration and showing everybody how the software works, but in terms of everyone else learning it's not very efficient. People do learn better when they are actually doing it. It takes a little longer, and you have to hunt down the labs to use and get everybody signed on and it is a little labor-intensive, but it is a much better way.

We still need very good paper documentation, and we didn't really put full attention to that as much as we should. We had all this on-line documentation, on-line manuals on *Netscape* to see if we could access [those], but the students really do like to carry around that piece of paper, and we could have given that more attention. Here's what our *First Class* manual on the Web [looks like]. And that's all well and good, but, as I say, paper would also have been important.

Now, about evaluation. From the beginning of our project we've had a team of three people evaluating it right from the start, and when you have 3,000 students and 40-some-odd classes, that's a pretty big project. So the Office of Instructional Resources has been handling

that. They are using direct observation, surveys, interviews; they are having comparative data between classes that didn't use it and did use it as far as the student learning results go.

It was really interesting in one course — it was a classics course — where the students were given a questionnaire and it said, "How do you feel about using this networking?" And they wrote words I can't even say to you — "What the blank is this all about?" You know, it's very funny. I think that they got over their initial hesitation, but it was funny.

So what have we learned? Well, we learned that there is such a thing as the on-line teacher, and that it's a little different than the classroom teacher. You are in a different environment; you aren't getting the verbal clues from the student. You have to think about this — this is not something that you just leap into. You have a role. You have to help the student, and you have to help them become a different kind of student. You have to help them take a strong role in their own learning if they're used to having everything come from you.

The good on-line teacher promotes student-to-student communication. It's not a top-down process so much, it's — if you remember taking statistics and how you broke up into study groups and helped your friends get through, it's that kind of teaching.

The good on-line teacher likes to be available to students, because you are available to students. And if you don't particularly like that part of teaching, then this maybe isn't the place for you to be. The good on-line teacher gives timely feedback and gets on the Net fairly often so the students can start to count on that. You facilitate the self-pacing of the students, and you work harder to help students learn more.

I guess at this point you have to learn what an "emoticon" is. Those are the happy faces on the Net, if you aren't familiar with them; if you turn sideways you can see there's a frowny face and a smiley face. After each of your communications with the students, because we lack the verbal cues, we have to learn how to handle the emoticon so that we can express [something like] "I am joking here, I am happy here." Everyone tells me I'm the only one that does a left-handed happy face, but so be it. You have to learn that, too.

As I said, you have to develop this network persona. Now, in my case, do I want to be Doctor Marsha, Doctor Woodbury? Do I want to be Marsha? I mean, I want them to address me in a certain way, and I have to decide that fairly early on and set the tone with my students. When I talk to the TAs I'm very, very hard on them about this, because some of them are actually younger than the students they're teaching. We use undergraduate TAs in this project and they might even be 18 or 19 and be teaching somebody 25 or 30, so for them to establish authority it might be good to have their full name. I also tell them they can't date their students, which they don't like very much. But I don't recommend that.

The motivation for your students is going to come from you and you're going to transmit that on-line, so you really have to be keen on this. There's no point in starting if you really are reluctant yourself. That's where motivating faculty is really important, because they really should want to be there; the students will know quite quickly whether they do want to be there or not, so we urge them to be as warm and timely as they can be. It's hard to see, but we have little smiley faces on some of the little discussion groups just to have areas where the students can get in a chat.

One of the things that you can really do to help your students is get very structured, because the on-line world can be a very confusing place if all the communication is going in a big jumble and people are just sending message after message and it's all going into a big pile. So you start well before the start of the term and you set out clear discussion topics; otherwise you'll have a mess on your hands and a mess is hard on your students.

We did have a teacher who divided his areas not at all. He left it totally open and he got hundreds of messages in one long stream, so that everybody was writing and it could be — one

message could be, "What do I do on problem 5?" The next message could be, "I wonder if the Cubs are playing in Chicago this weekend?" No one wants to read though a lot of drivel.

By structuring your class you guide their learning and it also helps you structure your course. It actually is a very beneficial thing. So you must schedule and organize your course very thoroughly, and put the readings and assignments in place for your students. So, as I say, start early and get this going.

As we talked about in the last lecture, opening and closing discussion areas is kind of an important thing for the on-line students. They sort of — things keep trailing on. When you've finished one problem set and you've moved on to the next, you've got to let them know that that area is now finished.

Now, work groups. I don't have all that many suggestions to you, but maybe I will next year, on how to do work groups successfully on-line; we are having our teething problems with this. They do provide challenges. If you say to five students, "I want you to work on this project," some of them will say, "We like to get together in person, we don't want to work on-line." And there's really no reason why they shouldn't get together in person; they are on a campus and they can meet. But we often get students who have to drive 20 miles to the campus and it is very inconvenient for them to come back 20 miles to meet with the group.

We have the older, returning student. We have people who are working and we're trying to encourage them to get on-line and do their talking in their work group on-line, and some of them are very reluctant to do this. So I can't give you the answers here.

I think that the best model I've seen is the Veterinary Pathology I, where they did the simulation and had a time limit and they all worked together for several days. It wasn't an unending, long procedure, because I think for three days you can motivate students to get there and get together and get on-line, whereas over a long period of time I don't think it works that well.

I think another thing that you can do to help your students if you're going to have conferencing is to start it out right, because this is not the Internet, this is a classroom. A lot of students who are used to the wild and woolly Internet think they can pretty much post anything or flame anybody or do anything they like. So I kind of set the tone that this is a classroom. You can even have a policy statement, if that does any good or not. This one says, "Don't write anything in *First Class* that you would not say if you were to stand on a table in the middle of the lab and speak it." That's what one teacher put just to remind them.

We did see some evidence last summer of some flaming, not too bad. It was actually misunderstood. It was a work group, and people were kidding one another, but we didn't know they were in the same work group and we were kind of concerned about it.

Traps. I think one of the things — because this software is so easy to use, you can actually invade privacy very easily. One of the things that I do or I insist that we all do — I don't know that it's followed, but it's my policy — I think the students have a right to know who's monitoring the class. I think you need to tell them that other faculty members might be looking in and watching and see what's going on in that class.

On *First Class* each student can have a resume and tell a little bit about themselves, but I don't think you should make a student put his or her picture up on the Net. If for whatever reasons they don't want their picture up there, they shouldn't be forced to have it; it's like forcing a student to have a Home Page with a picture on it. Some people have concerns about their privacy, or they are not all that crazy about their appearance. One of the great things about the Net is that when you are talking to somebody in text, you don't know if they're fat or thin or if they are quadriplegic or if they're black or white or yellow or green. If we ask people to put their pictures up, then we're kind of destroying their anonymity and we're

starting to judge them by their appearance. So I would ask you not to. Just respect the students' right to remain anonymous if they wish to.

Also, as a teacher, on this issue of flaming and whatever, I think you really have to get in there and take a responsibility. You have to monitor it often. You have to separate for the students the areas where they can chat and talk about the baseball games and whatever and separate that from where students are asking questions about class, because they don't want to waste their time, if they're time is limited, reading a lot of drivel. So by separating out the areas, you actually help them. Again, [in terms of] flaming or abuse, you want to save them from any kind of insult.

If a student is really, really not getting it, you can withhold that student's privilege to write into the group. You can allow them to read, but you can actually make it so that they can't write. That's an extreme measure that I haven't seen taken, but that is something you could do.

We have had a problem with [the fact that] we use labs and students sign into the computers and labs. What could happen here is that the student could come, sign in, do the business they had to do, get up and leave and still be signed into the computer. The next student comes in and realizes that — here's a free ride, [with] someone else's name — and could start posting very insulting or even pornographic comments.

We had the pornographic ones happen last year in a group, and what happened was that the person who discovered this discovered it at 7:00 in the morning and erased all the messages that she had power to erase, but she wasn't able to erase them all. There was a high school group that had a discussion and, unfortunately, some of the students read some of this stuff. But it was just because a student walked away in a lab leaving himself logged in.

Now, one of the things that could happen to you as a teacher is that the students could want to talk to you a lot. And they could actually task you — I mean, they could really have you do a lot of work. They might like it on-line, they might like to send you lots of messages. You have to draw a line on that, too. A good teacher questions and builds thinking skills, so what you want to do is if they ask you to answer a question you really may want to hold back. You may want to just give some other students time to jump in and try and answer it first.

What you're really trying to promote is students talking to students and learning together. Maybe you want to ask those questions that lead to thinking, and that's kind of hard for some people who like to know all the answers. But maybe [it's not a good idea] to jump in with the answer straight away; throw the question back on the student so they don't get too dependent on you.

Since this is the Internet World, I want to show you a little bit about what we're doing on the Web. We have our own Home Page and we're using *Mathematica* software from remote computers in the way I was describing before. In other words, we're using the Web to access *Mathematica*, ask questions to that software, and have it spew back the answers. Chemistry courses are taking it.

Here's one where they're showing a problem, and the student has to write the answer in and will get an answer back from the computer. Is the answer right or wrong?

We're very proud at the University of Illinois to have *CyberProf*, which is another one of these wonderful things that comes out of our school. This is the same sort of thing, where very technical problems are answered by students remotely, and then they're given a hint if they get it slightly wrong and they're actually directed to the page of the class notes that the problem was in. And those notes are on-line.

Here's a multiple-choice test that's on-line for students. They can take this as many times as they like and get feedback on whether they are right or wrong. Then they can write in to the professor and say, "I keep getting this question wrong; I don't understand why it's

wrong.” And then the professor can say, “Well, you know, here it is, or here it is in the lecture notes.” So here’s a multiple-choice test, and this is what their answers looked like. They might get two right and two wrong or something like that.

[I want to address] the future. Well, what we would really like is we wouldn’t really like to teach two different kinds of software to our students. I’m saying this as the person who’s the trainer, but I would like to just teach one thing. I’d like to have it all be done on the Web, and I’d like to have the conferencing and the course materials and the drill and everything in one place, so that as a trainer I only have to familiarize the students with one kind of software.

We like *First Class* and we like *Pacer Forum*, the fact that you can send in your graphs for correction, you can send in pictures. Right now we haven’t found an easy way to do this, uploading the files to the Web and uploading pictures. We haven’t found a real easy way. We think we might do that through e-mail; we may have to do some kind of e-mail form to send a picture in and back. I haven’t had a full look through the exhibit room, and maybe there is already a Web conferencing tool that will handle everything. We haven’t found it yet, I can tell you.

We have to learn how to mainstream the technology and establish standards for using it. Mainly, we’ve got to make it easy. It’s still too hard. We have the problem of our modems getting overloaded in the evenings, and we have a lot of technical problems. So we’re a long way away. I keep asking for the Model T Ford of the Internet to come along, because we just need something to make it easy.

Then we have the problem, as discussed before, of motivating the traditional faculty. What we’ve done in our project is [make sure] they have the best access to the Internet of anybody. They have their own private modem bank, and we give them all the support you could want. We give them graphic design support, I go and train their classes for them, I train them. We also must see their teaching load, or they must see it as fair. And that’s something that is really hard in a university environment where we’re cutting back on money.

I guess my last parting thought for you is, when you’re through changing, you’re through. So that’s what we’re telling the faculty.

I’m open now to any questions, and thank you for coming to this late-hour talk on a dark and dingy afternoon. I really appreciate having you here.

What we have now — we are in the first wave and the first main semester — we have self-selected faculty. We have people who have volunteered to join this project, who have written us for computers and what have you; so we have people who are already interested in teaching, interesting in learning about changing. I haven’t had to work with somebody who isn’t interested in changing yet, so I can’t answer your questions as far as that. Most of them want the contact. I get lots of feedback from faculty that they’ve had better discussions with their students since using *First Class* than they ever had before. They are happy. But they are the self-motivated, self-starting ones, so I don’t know. Yes?

M: How do you adjust faculty [inaudible] project?

Marsha Woodbury: It’s all by department. We have no control over that; we’re sort of a service branch, so it’s up to each department how they are going handle it. We have some teachers who have three separate classes on-line, and they liked it so much they came back to us and said, “I want to put my other two on-line.” So I think they are teaching their full load plus doing it on-line, but they just love the interaction so much that they’ve wanted more. Maybe in some ways it makes it better for them. The reward is that they are getting more quality teaching.

M: [inaudible]

Marsha Woodbury: Yes, right now. Right now, uh-huh, that I know of. I mean, if some department is making some kind of a provision for this, then I don't know. Yes?

M: [inaudible]

Marsha Woodbury: <http://www.scale.uiuc.edu/scale/>, and then there's a /scale/. I should type it up for you. So it's www.scale.uiuc.edu/scale/. Well, I think that you've been a wonderful audience, and I'll let you go.

WORLDWIDE WEB MARKETING ON THE WWW: HOW TO PROMOTE YOUR PRODUCT IN THE MOST CLUTTERED ENVIRONMENT IN THE UNIVERSE



SPEAKER
Larry Chase
President, The Online Ad Agency

Larry Chase: Thank you very much for coming to "Marketing on the WorldWide Web." We are going to start our lecture about marketing on the WorldWide Web in this many-to-many universe with a childlike example. This is something that is actually on the Web site that we publish, so we get it in two different places; we show it here in presentations, and then people can see it on-line.

You get a document out of the same 10K small graphics file. This fellow is known as "froggie," and froggie in the WorldWide Web is a Net surfer. There are many kinds of frogs, and you have to figure out what kind of frog you want to talk to.

Some people ask me, "Well, how many people are on the Internet?" I have essentially two answers: one, I don't know, and two, I don't care, because if I am marketing to the Internet as a whole, I am doing something wrong.

I think it's probably a good time to say that, first, the Internet is not one market; it's tens of thousands and maybe hundreds of thousands of markets. Secondly, the Internet is not one medium. As an ad agency we have got a budget for TV, radio, direct response and the Internet. The Internet is really a tangle of mediums, and the WorldWide Web is just one of them under the Internet umbrella.

Today during the show we will talk a little about how these wrap together, and how you use the Web in conjunction with other on-line media like e-mail and UseNet. One is technical, one is graphic. Like in radio and television, one has pictures and the other doesn't.

Here we have a Net surfer. We have a depiction of your Web site. That's your Web site, a lily pad. If we go to the next frame, that's the WorldWide Web. So the problem that you are faced with, that everybody is faced with, is that the cost of distribution of information, commercial or otherwise, has plummeted through the floor. You don't have cost of distribution. You don't have cost of printing, cost of handling, cost of fulfillment, cost of postage, cost of warehousing in the case of catalogues. Although costs fall through the floor, it doesn't mean that it will replace any of the aforementioned media. It's augmentative, at least for the purposes of this demonstration.

This is the WorldWide Web, and you are a lily pad. By the end of the year there will be 5,000 other lily pads. The question then arises; why should somebody go to your lily pad as opposed to the Library of Congress's lily pad or the Met Museum's lily pad or the 800 Flower's lily pad?

What's the incentive for froggie to jump to the lily pad you have constructed for your frog or your niche of frogs, once you have identified your frogs? How do you get word out to those frogs that this lily pad holds some really delectable information or some novelty or financial incentive, which are the essential three core arguments that I see as being necessary to draw your kind of frog to your kind of lily pad?

How do you do that? You have got to send out messages that are narrow-cast to the universe of your frogs. So if we move on now, we will take a look at one of the pieces of "cyberbait," as I refer to it, that bring frogs to your site.

Let's go into content. There is a content war out there; you have a [continual spate] of magazines, as we know it in the physical world. We have got examples of content that's very indigenous to the Web. There are some sites that we visit every day. If we actually go into

something called NetDay, in there we see different things that are related to our business. Our business happens to be all Internet, all the time. We go to things that are "Internetcentric." There other cases and other industries in a business-to-business sense that will attract your market into your site.

If you take a site like Wiltel — a telecommunications company, I believe the fourth largest long-distance carrier — they mostly talk to telecommunication managers at large companies who buy in bulk, who buy a lot of bandwidth and telephone lines in bulk for the companies they work for. They have created a whole telecom index of things that are of interest to their community, their frogs, their target audience.

iWorld is something we visit, being indigenous to the world we work in. People who are in telecommunications are going to look at things that are indigenous to them.

Then, at some point, Wiltel would like our summary of information, the *Telecom Weekend Review* e-mailed here. What does this do for a company like Wiltel? It's very focused; there's no cost to fulfill it, and you build up a rather substantial e-mail list which is more of a direct response tool, an electronic-direct response tool, an e-mail list of qualified prospects.

Much in the same way, on a consumer level, a company like 800 Flowers will say, "Do you want us to remind you via e-mail," [which is] another medium of the Internet, and "would you like us to remind you that it's your anniversary two weeks ahead of time and send a dozen roses?" Would you like that? Only if you hit "yes," a year from now that happens.

In this high-tech, high-touch environment, the consumer will know that the things are robots and somebody didn't sit down and craft them a message; but they appreciate the fact that it's a good service. That helps me; that's a good reminder that I should be thinking now is the time to be thinking about buying flowers for an anniversary or birthday or what have you. It's not a bad idea; it's a relationship type of marketing, a longer-term relationship. That's what Don Pepper refers to as the "one-to-one future," and that is one-to-one marketing. To be perfectly honest, if the Internet didn't exist at all, marketers would still have to grapple with the one-to-one marketing shift that is taking place.

It used to be that there was not a lot of choice of information. Today I feel battered by information; by the end of the day I am sure you're overcome with information. You have got a brain full of it or a shopping bag or a pocket full of business cards, like I do, that you are going to have enter in. So you are going to need some filtering done and some choices made.

Of course, some of these things will happen in what they call "personal assistance," or "intellectual assistance," which goes out and looks for you. It gives a profile. I say I am interested in the following information: I am looking for a job six months out; I will be buying a car one month out, and I want two air bags. You will basically tell it where you are in your life, and it comes and brings in information, commercial information, a lot of it.

The point is, it will go out and automatically do some of the things you are now doing manually. Therefore, when programming your Web site in today's manual universe, you want to make sure that it attracts the person now, grabs that mindshare now and makes sure that the future habits that are basically being cast right now on the person who is surfing the Net. That's probably a good reason to get started sooner rather than later.

You want to make sure you're not just putting on sound bytes of your CEO. If you have got 500,000 lily pads and your basic message is, "come and download for five minutes [and get] a ten second sound byte of our CEO," that is not a very big draw.

Maybe it's obligatory that your CEO is on the WorldWide Web, but I don't need to see it on the Home Page. What I would want to see on the Home Page is something that excites me. I asked Glenn Davis, who does "Cool Site of the Day," what tickles his fancy. What makes a Cool Site of the Day? [His answer was,] "There is a little boy inside me. When it gets excited

about seeing a site, that's when I know I have something." You need to build and generate that excitement into a Web site.

Unfortunately, daily updates of sound bytes of your CEO, more often than not, aren't going to cut it. You will have to figure out what's in it for your audience to come visit. It's probably not a brochure. People may be willing to look for that, but not as a rule; they are much more self-centered. It's sort of, "enough about you, how about me? How can you serve me? If you want my attention, if you want my mindshare," as Don Pepper says, "how are you going to do that?" How are you going to get them to come back to your Web site?

What good is it if you bring somebody over to a Web site, and they hit your Home Page, and you're only able to show upper-level managers? We have two hits today, and we will never see them again. What have you accomplished?

Brand awareness advertising is important. It's an interactive medium. A lot of things that are happening today on the WorldWide Web are direct transfers from previous media that we have grown accustomed to over the past 50 to 100 years.

The same thing was true back in the 1940s and 1950s. Look at television in the States. You go back and look at the old early television, and you see Old Gold cigarette boxes dancing on stages for 60 seconds. What were they thinking of? This guy in the Oldsmobile singing opera to his girlfriend in a convertible on a set, and they act like they are driving. There is nothing going on behind them, but they are driving. There was no strategy; it was more like radio, or what radio people thought TV would look like, that's happening mostly on the Internet.

When I was a kid, I remember — I grew up in New York, and I remember we used to watch the test pattern on Channel 11. I used to call it, "the nothing on." Today that test pattern is burned into my psyche.

Howdy Doody would come on with the dog, with the wooden jaw and his dog Farfel. These were corny things. It's the age of Howdy Doody on the Internet. It's not going to take 30, 40, 50 years to go back and laugh; it's going to take three or four years because of the dramatic changes that are happening in technology as well as in bandwidth.

If you read the last *Internet World*, there was a very big piece in there, an interview with [George Gilbert]. That's another person I would encourage you to read; he put forth the proposition that the cost of bandwidth is going to fall as precipitously as the cost of computer chips. Gordon Moore's Law of High Tech says that the chip doubles in power every 18 months and halves in cost, so you have got a factor of four. He is saying that what happened to the computer chip in the eighties is going to happen with bandwidth from here out. I hope it comes true; I want to be swimming in bandwidth myself, so you will be able to have a lot of moving imagery.

Even right now there is enough to do without projecting very far out. What's after the Web? I have no idea. I am having a hard enough time keeping up with what's going on there. There is so much going on, we have got to — we have to catch on to what already has happened to realize that you can't just simply go around the WorldWide Web, go into an area, and then scroll to the bottom of the page and the advertisement. It has a name of a company. It's hyperlinked, and because it's hyperlinked you are going to click on it. I think the content and the advertising have to work side by side; it has to be an appropriate juxtaposition, otherwise it will be what I call the "we interrupt this content for an off-topic Home Page brought to you by the sponsor of this page."

If you had a choice of looking through an ad or continuing on with that story on page 36, would you read every advertisement? That is equivalent to clicking on an ad. You need an incentive, a content incentive, or financial incentive or novelty. You need an incentive to answer the critical question: "Why click here?" That's the question that you have to answer to get the

people over to your Web site. Why click on whatever you've set up and why come to your site? Click here to see my Home Page.

When we first went on-line, we had some slick graphics, some information about what we thought and what we have done for our early clients, but thousands of people went over it because they never saw an ad agency on-line. Today one goes on-line every hour or two. I saw another agency go on last week, and they had a focus group, an on-line focus group, and it says fill out this questionnaire this week. Come back two more times for two other questionnaires, and we will give you a T-shirt with our name on it. Let me tell you, if you come back to my site to fill out three different questionnaires over the course of three weeks, if you have spent that much time just for a T-shirt with my name on it, I don't think I want to know you.

You really do have to think of the surfers' best interest, because the worst thing they can do is ignore you. Ignorance is like, "I see you, but I am not paying any attention to you." Out of sight, out of mind is really where it's at on the Web.

You can build beautiful, fantastic, rich content on a Web site that's beautifully constructed, fast-loading and very well-navigated; but it's true you can build a Web server in the middle of a forest and nobody knows about you. You will find some hackers or worms that ultimately will find you, and you end up in some indexes, but ultimately you will need to build traffic into that site.

Your inventory is information or a financial incentive. You are a store. You have to put out the grand opening sign. You have to put ads in the local newspaper; that's what you do when you post it up to *Yahoo* or the *WebCrawler*.

What are you going to do for an encore? This is a problem that I see. A lot of people who call us have spent what they think is a lot of money building a Web site, good or bad, but they didn't think of the ramifications of updating. Whether you like it or not, when you get into the Web business you are now a publisher. When you put a Web site up, you'd better refresh it.

Barring the cost of entry and quality of content, when refreshing that content, costs gets higher and higher all the time. This is why I wonder whether a lot of subscription-based models will work. So if you are offering something for a subscription, a year from now you might have three other competitors offering it for free through advertising.

Maybe it isn't the 80/20 rule, where 80% of your revenue comes from advertising and 20% from subscription. I think more often it's the case that you get 100 percent of your revenue from advertising. If it's not advertising, then it's another method.

It might be comparable to comparing the costs to how much it would cost to put a salesperson out in the field. Let's say it costs \$200 to \$500 for a salesperson per sales call, no matter whether or not they are able to do anything with that sales call. I am talking more business-to-business; 800 Flowers doesn't have to send out salespeople. Maybe those are the figures that you should compare to if you are able to build a customer database from an e-mail list.

We have this information. We used to consider it proprietary information; here it's for free. You want to know when it's coming out? Tell us [you want to know]. Let's have your name, give us permission to talk to you and open up a relationship with you. That might be the way you have to rationalize your Web site if it's a business-to-business proposition.

The gas company — perhaps at some point there will be on-line payment with them. Have the customer enter it electronically.

You'll get your paycheck electronically; I have been doing it for five years. It's not a farfetched thought that I am going to be paying my phone bill on-line. Do you know how much money that saves them? If they are smart, what the phone company ultimately should do is say we will give you a five percent incentive; we will take five percent off your bill if you pay on-line,

because we are actually saving eight percent. That is more of a partnership with your customers.

Let's take an insurance company; there's a grudge purchase if ever I've seen one. Why in God's name go to an insurance company site? I don't hear any answers out there. Has anybody been to an insurance company site? I see a couple of you who must work in insurance. People buy insurance. What kind of decisions do they do around insurance? Well, they buy insurance because they don't know when they are going to die. Maybe if they knew when they were going to die, maybe they could have some handle on how much money to put aside if they could just manage to figure out when they were going to die.

So Northwestern Life Insurance Company was very kind to help you figure, give or take a few years, approximately when you are going to die. This is a great use of technology.

If I am doing estate planning, ITT Hartford has an estate planning calculator. It has a sense of humor. At the beginning, if you have an estate under \$1 million, it tells you don't bother. But it helps you figure where your assets should be. It will tell you, "Oh, you can't retire until you're eighty," according to how much money you have and the mortgage and the Volvo in the driveway. You need to know these things.

That's not a bad thing in a company like Northwestern Life or ITT Hartford Insurance. If you saw that technology there, you might go to their insurance broker. If you have to buy the stuff anyway, you might say, "Okay, send me some information or have a sales rep call me," or "I will call or send an e-mail." How much does it cost? Nothing.

To be perfectly frank, I will tell you how wrong I was when two years ago some journalist asked how long it would take for consumer companies to come on-line. I said I see that coming two and a half years away, and then two weeks later Pizza Hut came up and proved me wrong, pleasantly wrong. It's great fun to see consumer sites come onto the Web, and seeing the thing critically massing and going beyond expectations, beyond where I thought the thing would go.

While on the subject of consumer media, why should somebody make a purchase on the WorldWide Web as opposed to calling an 800 number? If there is financial incentive, a company like 800 Flowers, like a lot of companies on the Web, then pass some of the savings along to the consumers, and there is that incentive to do that. The consumer is empowering the provider of a product or a service to provide that product or service.

It's not too dissimilar to when Gateway opened up the sales channels of magazines. The thought of buying a computer from a magazine was preposterous; you go down and you want to sit at it, look at it. Now it's hard to find computer stores. I know more people who buy them mail order just so they don't have to pick the thing up and bring it to their house. They know computer commodity items and brand names, and people feel comfortable buying them remotely.

While on this consumer thing, when 800 numbers came out, people did not rush to their telephones to give their Visa numbers away to a stranger in Iowa. They weren't comfortable with that; their habits had to shift. Just because it can happen doesn't mean it will happen overnight. People have to come into it comfortably.

You will get "early adopters." Everyone in this room is an early adopter, or what we call "heat seekers." A heat seeker is someone who — normal people look at a problem and get a solution, heat seekers look at a solution and go and figure out what problem it solves, and how to use it as a competitive advantage. I suppose most people in this room are in the latter camp, because they are here. That's what the Internet is, it's a heat-seeking device, a competitive tool.

Federal Express allows you to do package tracking. This is perfect for the direct market. It turns out that UPS also has it, but Federal Express was first in that position, and got attention

and was seen as being a leader and innovator in the field of package delivery — in a medium that competes with their core product. But they were open-minded.

A gentleman by the name of Bob Hamilton carried the flag on this. You have got to follow through and use what is there, because if you don't somebody else will. You might as well do it earlier. You might as well write the agenda, rather than having your competitor write the agenda and then having to follow that script. Write the rules of the game first. We did it.

Let's go to WDFM. This is a personal history; this is the anatomy of the Internet business. This was originally internal information for our on-line ad agency. Eight or nine months ago we didn't let this information out, or if we did, you paid dearly for it. Then we got the idea that we'd sell it as a subscription, \$125 a year, and we launched a subscription service and got a lot of checks. At some point someone will offer that information for free. What will happen? I was greedy. I had these checks. I had to tear them up, and you have no idea how that pained me to tear all those checks up. Normally \$125, now free. But it built traffic, this content built traffic, the kind of traffic that a company like an on-line ad agency wants. This is self-defining traffic.

I don't know how many people make it here. I don't need to know. When they fill in the guest log and tell me what company they are from, that they are the executive vice president for a Fortune 1000 company, that tells me enough. That tells me where I am in the food chain of being a Web marketer. It's hard to find those people. Almost half the people that come to visit this site are people in the IS area — information services.

I find MIS [marketing information services] people are more apt to adopt marketing concepts than the other way around. You have to understand the topography; MIS people do better because they have been surfing the Net for a long time.

We didn't know who was visiting; this was before the tracking schools. In the guest log, we give you an incentive to fill it in. Everything has an incentive. The Web is more like a direct response and sales promotion, because it elicits a response. We know better than to ask you to give us information out of the kindness of your heart.

In the guest log we will tell you where we get our best information. If you want it unfiltered, fine, be our guest. That's how we got something like 1,500 people filling out the guest log, because we gave them a reason. As a consumer I am in the same situation. Do I fill out guest logs just because they ask me? Frankly, I don't have the time. I suspect that most of the people out there don't have the time either, the same way they don't have the time to come back and fill out a questionnaire three times for a T-shirt.

You really want to respect the user's time. You can make certain conclusions about who's out there: they are connected; they are on a computer, modem, and probably reasonably well-educated. However, even in these early days of data-gathering we don't know who is there or how many.

Again, I hearken back to the early fifties, to Procter & Gamble and Colgate and other major advertisers in TV media. TV sales are really skyrocketing, [they figured,] and a lot of television stations are going, so we'd better start buying products like the TV version of the soap operas and start producing those.

In the early days the advertisers owned content and the ad agencies managed that content for them. In a very real way that's happening again. You keep hearing that content is king; well, it happens to be true. That is what people look for out on the Net. Sometimes that is commercial content, sometimes it isn't, but you do have to work under the philosophy that some aspect of commercial content is actually sought after by customers.

Look at classified ads. One of the most successful revenue streams for a newspaper is the classifieds. They're for jobs, real estate, for travel. Classified is a searching kind of mode to

be in, and that makes the WorldWide Web a very nice place to have certain kinds of classified ad information. It could be classified ads, but the model is different.

Yahoo is essentially a classified ad medium. You have the model, we will list you for free. Just like the Yellow Pages where you get a business line; they give you a free listing, but if you want that listing in bold or a little more, you want to display it in red, [it costs] different tiers of money. The same thing with *Yahoo* and *InfoSeek*.

We go to *InfoSeek* and you put in the word "hotel." Somebody puts in the word "hotel" or the word "travel" or "weather" — which are fairly popular search words — and people go out there. Trends of search words are popular, so you put one of those words in your banner.

We will do search for hotel discounts. You have to assume someone who puts in the word "travel" or "hotel" might be interested in discounts on hotels. It's a safe assumption. So Hotel Discount happens to be one of our clients. We made this purchase, this media buy. We made this media buy for them, because you actually buy the words. We didn't want it to be so random it would just go into utter rotation and come up anyplace.

We should know that this service is out there for anybody who's looking for travel or anybody who's looking for hotel accommodations, which are other keywords that we bought.

You can do the same thing on *Yahoo*. Then you get that banner, and this is the equivalent of having a display ad in the Yellow Pages, where you are paying extra. You are probably listed down in the regular listings as well, but you want a premium position and you have to pay for it. It's advertiser-supported. It makes perfect sense.

By its very nature, it's financial incentive. I think you are going to see a lot of incentive kinds of companies. If we go to Airline Discount, this is a different kind of media buy. For Hotel Discount, we went to the appropriate groups in *Netscape* and in *Yahoo*, *What's New*, *Mosaic III*, *IV* and *V*. Hotel Discount is up and available on the Web at its URL. That's great.

Again, what do you do for an encore? Where else do you post? It stays up there for three days or less. Because there are thousands of sites going up a day, you need to weave yourself into the fabric of the Web. One of the ways that we did that is we went out and scanned around for "affinity" sites, and ironically enough Airline Discount went up the same week.

So, on our client's behalf, [we approached them.] "Hello, Airline Discount, we are representing Hotel Discount. Shouldn't we point to each other? Somebody looking for discount seats may look for a discount hotel." "Yes, excellent idea." We did that sort of affinity relationship, cross-linking with probably a dozen sites. These are deeply embedded.

Does that mean that we get thousands of hits off these sites every day? No, it doesn't mean that. Does it mean that we get fewer but more qualified hits, hits that are more apt to convert to either a sale in that session or in a session two, six or twelve months out? I firmly believe so.

Back to Hotel Discount. We found out something; we call it "just-in-time" marketing. When we launched Hotel Discount, we were staring at the Web, logging on in almost real-time. "How's it going?" "*Yahoo* just kicked in." "Wow, *What's New*. That's great."

It kind of trails off, and then just stays there. It was mentioned in the *New York Times*, *L.A. Times*, and it goes up and down like that. What we found was that we started getting some conversion.

So we found about 20% of the people coming into the site — [and we found this] just by looking at the Web logs — would give us the domain names like .NR and .DUS and ones that had European addresses on them. Well, okay, 20% of that's interesting. We figured maybe about 20% come from Europe. We also found that 20% accounted for 50% of the room nights booked. Wow, that's where the action is.

Then, of course, we quickly postulated, why is this? Let's figure it out. Maybe because the discount channels in Europe aren't as well entrenched — sort of a Wal-Mart on-line. So we have frogs coming over from Europe to visit our Web site; how do we get more of them to know about us? So we had to do — it's like a sales promotion, and event planning. Here is what we did.

We took a drink of water; then we thought about it. We said, okay, if you are a tourist coming over from Europe to the United States or going from one city to another, do you have to change your money? Out on the Web there are some currency converting programs. Bob Olson has a great currency converter. This is a great thing. Olson has one in Canada, and some of them update daily. Olson has one in Switzerland. We talked to them on behalf of Hotel Discount.

We want to mirror your calculator, [we told him]. We don't want to recreate it, we just would like to mirror it over on our Web site, and then run promotions to Europeans coming to the United States at certain sites they are apt to visit while traveling abroad, [where they can] check out our currency converter on the Hotel Discount site. So Olson said, "We will work out the deal. We will tell you about the currency converter." And [for us], that gives us a hook to go out and tell that target audience to come back to the Hotel Discount site.

While you are on the Hotel Discount site, there are other neat things. You might find a free subscription or three months' trial subscription to *PC Laptop*. You won't, but it's an interesting idea. It's an idea for perhaps people who are in business and traveling, and may have PC laptops. I know we are talking to one provider about supplying this to members of the Hotel Discount Fast Book Ticket Club. I can say, for members only maybe, that ThinkPad batteries are 40% off. Whatever it is, [it has to be] something that has an affinity, has a relationship to it.

I can't stress enough that it must be contiguous to the product and service, and therefore to the audience that you are trying to serve. There's a long-distance company [that has a] clickable map, a museum magazine. That's very nice, but I don't understand. I don't understand why a telephone company is talking to me about museums. If that phone company had that clickable map, and I click on the network and click on in Chicago and find how much I would save with their volume discount business-to-business plan, that would make more sense to me. I think a lot of these promotions don't make sense, and only serve to confuse the customer.

I worked at an ad agency that had quite a lovely reputation for many years, and Bill Burnbeck said, "if you are going to turn a man upside down on a page just to get somebody's attention, you had better be selling zippered pockets." Whatever the gizmo or the come-on, it has to flow naturally out of the product. Otherwise it can and will confuse the customer.

Oh, by the way, there was a typo in the catalogue in your program yesterday, on the publishing thing, and I apologize. It meant to say "Disseminate Information on the WorldWide Web," and it came out "Decimate Information on the WorldWide Web." So I'm sorry; I don't know how many people I lost by that in the seminar.

Anyway, that's the currency converting calculator. It's not too dissimilar to the "how long are you going to live calculator," the longevity calculator. There's also another one out there; it's not in our bookmarks today. It's called "Books that Work." This is a good one. Books that Work has an interesting calculator, a paint calculator. You tell it how big the walls are including the window space, whether you want to repaint or not, how many coats, and it comes up with how many gallons of paint. To me this is where the creativity is. This is what creativity is moving towards, how to take the technology that there is now and use it appropriately to deliver some kind of value.

There is enough technology today [even] if it didn't move any further, and of course it will. We've all seen very impressive things with HotJava and speed on machines and what have you, but there is enough going on today that you could have lots of good fun.

There is a Dutch auction site, very basic, very simple. Sometimes we can't get in, particularly at this time of day. I don't know why the lines sometimes jam up, which is unfortunate, and which is another reason why when we did that Olson calculator we only wanted them to give us a real-time currency feed for our purposes once a day. Olson is talking to a financial audience, and they want to market this out to financial companies like Merrill Lynch and so forth, and real-time is of more interest to someone like that.

Because of connectivity problems during the day between here and Europe, we decided once a day would be fine. It keeps the cost down, and for the traveling person who's just looking to change their money we think that would be fine. Just because the technology is there you don't have to use it all; that's what we learned from that one.

We are going to the Dutch auction. Still trying. This is all Dutch — does anybody in here know Dutch? Okay. It's a great site, just take my word for it. We are probably having connectivity problems. At the top of the page you have a picture, a picture of an Electrolux vacuum cleaner. It says that it's 900 guilders, and then, using that push-pull technology, 15 seconds later it says 850 guilders. 800 guilders... And suddenly it goes away and up comes a microwave, 900 guilders. It works. To me that's terribly creative; that's the kind of creativity that comes from mixing together an MIS person, an UNIX programmer, an art director and an account person. We call it Web therapy; the two of you have work together and cross-pollinate. You can learn marketing from these guys, [learn about] the content, the look and the feel.

Make sure you decentralize the operations, and [make sure] it has an editor, because everything points to each other. We noticed a site recently where there were 75 of their dealers independently up on the Web. You would think that the company would point to them, if for no other reason than because of a good relationship with the sales channel. Just say XYZ Motors Dealer Groups [on your site] — that was one of our suggestions to them, to point to them and relate to them. How much does hyperlink cost? Nothing. Help them out. Maybe even use what is called "cooperative advertising."

When local retailers run advertising, you will see a typical ad and at the bottom it lists 44 dealers, your local tri-state Honda dealers. I've rarely seen this concept on the Net. Diversify the cost centers, particularly if you have a system of franchise operators or a direct sales force. Bring them into the channels.

I saw something under nondisclosure that really handles this very well. It's very touchy; This whole idea of manufacture and service dealing directly on a one-to-one basis with the end-user is a very touchy thing with existing distribution channels.

Having said that, I have seen what I consider some brilliant executions of how to bring in those competing, badly bruised and abused distribution programs, co-opting them into the process and giving them the sale. It was masterful. I saw it as a major problem, because you are getting a lot of shifts, and a lot of middle people are going to be disintermediated. That is a 50-cent word [that means] you're cutting them out of the process, out-sourcing them.

This was something that I remember hearing Martin say to an ad agency. "Don't disintermediate. Don't farm out everything. If you farm out everything, you will ultimately farm out the value." Then the client will say, "what value are you bringing to this process?" You have to ask yourself how to stay ahead of that curve. From what I have seen, clients are really sharp on this stuff.

Again, since the research is very crude at this point, all I can tell you from my own personal interactions in working on the Web and gathering that guest line is that there are one

heck of a lot of senior people out there who are doing their own surfing. I am sure there's a lot of college interns doing it and printing pages and handing them up the ladder, but I can tell you that there are a lot of people who have a passion for this.

Let me go back to the creativity thing, back to the frog in the lily pad scenario. What was the frog in the lily pad scenario? Okay. People are often drawn in by just novelty. I mentioned, I don't know how long ago, the dancing Old Gold boxes. Why do people watch that? It was a novelty. People sat there stunned for 10 years watching that until they realized they could get a sandwich or something. It was a novelty at the time. Now there are a lot of novelties out on the Web.

There is a site, a graphic of a football game, and along the top of it is the Goodyear blimp. It asks you questions about football games, and if you get the answers right your team moves along the field. You have a couple of things to do. You can finish playing the game. If you play the game, you win a hat. You are there because you're a football fan, but they also have a baseball game. This is content, unusual content, creative use of content. I don't know if a copywriter thought of it or an ad person or MIS person thought of it; it doesn't matter. It draws something like 15,000 to 20,000 people a day. That's a neat place. That's one topic.

When you go to a football game you expect to see the Goodyear blimp. So you go to the blimp — or in this case the virtual blimp — and you click on it. Instead of taking you to the Goodyear Home Page, there's a sweepstakes behind it. What it says is that if you answer a few questions about tires you can possibly win a ride above the Super Bowl in the real Goodyear blimp. That, I think, is great marketing. The Goodyear site was up for a long while before that promotion came along. They had something there called "Tire U." or something. I don't know about you, but I don't get up every morning and think I have to know the latest about those steel-belted radials by Goodyear. But they make it interesting; you interact with it a little because you are here on their site, and you probably like football and would love to go to the Super Bowl. It would be the experience of a lifetime to go up in the blimp and see the Super Bowl from a "blimpy" perspective. The thing would just look like a big sandwich.

Okay, let's play. Do you know any football? Play a game with yourself. We are at the two-minute warning. Play a game, go to the sweepstakes. If I am interested in football — and I am not — if I had the possibility to see that game from the Goodyear blimp, I might go and take that challenge and learn a little more about tires, which may not hurt me. That would be great.

They do not interrupt this content for an off-topic; it is all part of this content, part of the topic. The payoff is on the topic because you get to ride in the blimp. That one was well thought out. That's where the creativity is. Who writes the headline? Who writes the copy? That's creative. Let's face it, that's been done before. Anyway, you get the idea.

We are going to [the site for] Mr. Potato Head. I hope there is enough bandwidth for Mr. Potato Head, which actually was renamed because of a trademark thing. I am not sure what I would do with this one yet. We want to give him a mustache and some eyeballs and things like that. The technology is here. Here's a creative challenge. What do you do with it? How do I use it in the way that is right? Right now it is a novelty. Should Lego use it? Maybe Mr. Potato Head himself should use it. I use it all the time; but again, I couldn't say, "come see Mr. Potato Head on the on-line agency." What do I get out of that? See people who are big Mr. Potato Heads? Why is he sponsoring that thing? It doesn't make any sense.

Let's go to Yahoo. There's a bunch of things, interesting things that are connected to the Internet. There's a whole list of these things. There's a guy out there who has this little camera that looks like an eyeball. His whole life is on the Internet. He is an engineering student out in the Midwest somewhere. Most of the time when I go to that site he is pointing down into his laptop, hammering out code.

Why couldn't you put a coffee pot on the Net and have Folger's sponsor it? Like give a pound of coffee away every hour, or have the "Folger's Morning News" and buy content from the *San Francisco Examiner* or *The Globe*. Play with it. Put it out there, have some fun with it.

Recently, in one of these seminars a few months back, somebody from Campbell's Soup said, "What does Campbell's Soup have for people to come and visit?" Maybe you want to put a thermometer for the top 25 cities, or maybe you want to put out different things like a cracker section — I don't know, I'm just winging it. Just to go and look at a soup can, I am not sure [that would work].

Have a mascot, have a dog that — they never know if you are a dog. It's perfect for Alpo or a dog food company to come in and have a dog. Have a mascot, a real dog that takes e-mail. It's probably happening, and we don't know about it.

One of the people who is doing a real interesting thing here is CNet. I happen to like CNet. CNet is [Studio Cam]; you have a half-hour hyperlink that runs on the Sci-Fi channel that points to the Web site every week. The Web site points to the television show, so you can find out in your market when it's going to air. It's perfect. This is tune-in advertising. If you listen to the radio, it sells you to watch television — "Watch Diane Sawyer on 60 Minutes on CBS, Sunday night."

If you watch television, it says "Listen to all news radio." If I look at TV Guide — god knows, there's lot of ads. There you are, in print, telling somebody to go watch television.

What we have noticed is that with the WorldWide Web and Web sites, CNet has found there the perfect synergy of promoting one channel to another. But there is a danger in driving direct analogies; direct analogies with previous media only go to a certain point, and then run the risk of being too literal.

You should think of your Web site as a cable channel in a limited site. It's programming, and you have to refresh it. People aren't going to watch Court TV replays. It has to be new stuff. You have to have new content. Hopefully, you have content in-house that you can refresh.

In this particular case, CNet is about the media on which it rides, and about new technology. It does a lot of stories about the WorldWide Web. You've got John Devoriak talking about different Web sites and technology and Web related things. TV is only a half hour long, but a Web site is infinite. Web sites are running a stream of URLs; URLs specifically find your operation or where to download that video or whatever it is. I think it's very well done.

If it were my money, which is the question I ask on behalf of my clients, would I spend it this way? How many qualified people are apt to hit here? If it were my money, I would want my advertising to come up at the top of the page. When somebody says this page received 200,000 hits — I won't even get involved in what a hit is, I will walk away from that. This page received 200,000 hits a day or a million hits a day. Maybe this page did get a million hits a day, but you can't tell me they scrolled all the way down to the bottom to get the advertisement. You don't have that information.

If I am advertising, I want my banner at the top, not at the bottom. When I walk around the Web I notice that most content tends to position advertising at the bottom. When you have a magazine, and you open the front page of the magazine, what is the first thing you see? An advertisement, what they call the "inside cover" or the "first cover." Then more advertisements, and then you see the table of contents. I think it's same thing with the Web.

In fact, some people actually like it because the advertising should tie-in. There should be a cross-merchandising effort. When I look at my Delta frequent flyer miles to check to make sure they caught the miles for this flight, when I get that thing that says, "here is your frequent flyer miles, you now have 200," what else am I going to see? I am going to see stuff from Hertz, stuff from 10 hotels; because if this guy is flying, he is probably going to stay at a hotel at the other end.

The same thing with a Web. It's more of a direct response, a sales promotion and event promotion type of medium than a branding vehicle.

That's my radical viewpoint. A lot of people would disagree with me, and that's good. There should be a lot of disagreement on what is what. In terms of what I would like, in terms of research, I would like to see somebody come up with where the conversion came to. A conversion can be many different things. A conversion for 800 Flowers can be a \$30 to \$50 sale; a conversion for Liberty Mutual or for Northwestern Life is somebody saying, "send me some information." That's a pretty good conversion. You have a customer who asked you for information. I call that a conversion.

The kind of information that I want out of research, as somebody who spends advertising money on behalf of clients, is the kind of information that tells me ultimately where that conversion came from. The person who converted it — where did they come from? Did they come from *Hot Wired*? Did they come from *What's New*? Did they come from *Yahoo*? It gets more complicated as you go.

It's something really radical if I find out that I get 50% of my audience from one particular hyperlink. Maybe instead of spending X amount of dollars on a hyperlink, maybe I give you a cut of the action, maybe I do a revenue-sharing thing.

There are analogies in my mind to radio. In radio this is called PI, "per inquiry." Sometimes late-night radio will make deals such as, "We will set up an 800 number for this commercial. We will run it and you pay 25 cents for each person that calls." That's not exactly a sold conversion, but at least it's a lead. Maybe it's on that PI kind of basis.

In a second I will tell you how I think the WorldWide Web is also like radio in terms of selling media. In sales there is a pattern I'm noticing; people have put tens of thousands into sites, many with good content, many with not such good content. [Then they'll realize] "My god, we are in the publishing business, and we don't have a sales force."

Originally they were going to go for a subscriber model; then they realized, no, free and open. We will sell to advertisers if we are content providers. We will feature advertising prominently because that's what the advertiser will want, and we will encourage the advertiser to do something that is specifically tuned into the content that we are talking about, so there is cross-sale. As in the case of insurance, maybe insurance should have a hyperlink to a car or automotive site. If you're buying a car, you're probably buying a new insurance policy for that car. That kind of tie-in is what's appropriate and what is called for.

[You need a] sales force. What you are seeing now are little companies popping up on the East Coast, on the West Coast and some in the middle. Many are going to advertisers directly, saying, "Can we buy a spot on your Web site?" I get a lot of phone calls, "Oh, you are an ad agency, do you want to sell advertising on my Web site?" [They do this] without realizing what an ad agency does. Keep redefining, keep being flexible.

Of course, a lot of people will come to our agency and say, "Okay, we have got a site and we want to launch it with advertising." That's great, but if I were an advertiser and it were my money, I'd ask, "Well, how many people do you have?"

"Well, almost one."

"Almost one."

"He's been spotting trains out in the desert for 20 years."

Okay. How many people do you have? You are asking \$10,000 a month to sponsor the site? Look at the quality of content. If there is nobody appreciating the content, what am I buying? How much per head?

Some people are saying there is a CPM model of \$20 per CPM. So people are saying if it's more consumers, it's more like \$5 "cost per thought." Some people are paying 10 cents a click. If it's just a drab banner and nobody clicks, you don't look too hot; then it becomes in my

interest to make sure that your product, that your service directly addresses my franchise and my audience, and is attractive and appealing to them.

We did a CNet studio. Let's go to the lemonade stand. There is a little girl at a lemonade stand. How much does it cost to put a Home Page up on the Internet? We get this question probably half a dozen times a day, from calls from all over the world. A little sign that says, "Lemonade 15 cents, Home Pages 10 cents." The idea here is that if you have an AOL account or a Prodigy account you can put a Home Page up on Internet. It's no big thing any more. Getting notoriety simply for putting a Home Page up is gone; the real question is how to put a marketing plan up on the Internet. Who are you aiming at? What do you want to tell them? How you are going to promote that on-line and off-line is something you want to consider very thoroughly.

I will go back and share some of the inside stuff on WDFM. Every nickel that we make on advertising we plunge back into the promotion to keep building the traffic to the site. We use that. Even when we make money, we use it. We make sure we don't make money; we want to keep getting more traffic in that will raise the rate card. That puts us in touch with a lot of qualified prospects.

You can imagine that people that go to that site are probably somewhere along the food chain. We may want to have a conversation with them. We are apt to e-mail back if they give us permission, and that serves us very well. We are not really looking at it for a profit center. The revenues from advertisements goes back into it.

We will pause here and take some questions.

M: Most of the people that are on the Web are educated engineers and technical people. What about the rest of the people that you want to reach, the bricklayers, the bus drivers?

Larry Chase: There is a supposition that most people on the Web are technical people. What about the bricklayers and bus drivers? It's a good question.

I don't know when the bricklayers and bus drivers en masse will be on the Web, but I think there are more than just technical people on the Web. It was my speculation two years ago that it would strictly be technical people on the Web, and I was quite wrong about that. There is a whole generation of kids going through college, coming out of college, to whom the Internet and the WorldWide Web is as natural a thing as television was to my generation, the baby-boom generation. Writing code is like editing film. We grew up on Howdy Doody. There is a whole group of people that may seem technically inclined to people who are older, but I don't think it's purely the MIS people that are on the Web. We are finding a lot of young people on the Web. I don't consider myself actually technical; I understand the technology and use of it, but I have never written a line of code.

Any other questions?

M: [Inaudible]

Larry Chase: The question is, how do I determine the value of my site for advertisers?

M: How do you charge your advertiser?

Larry Chase: Very conservatively. I will tell you, on WDFM, which logs-on weekly, we get between 3,000 and 5,000 people a week. Now, 3,000 to 5,000 per week is not like Netscape's Cool Site of the Day; WDFM will probably never have that many people. It's more like a business-to-business publication. It's more like buying a *Fortune* magazine. Even at that, we

charge a thousand dollars a month for people to get just a hit on the first page. We are not even charging — we don't even know, for example, the way people read WDFM. When they read a site they go out, then they come back, then they go to another site... They go out and come back. Every time they come back, we have no idea [they've returned] because they are coming back to the graphics that's already stored in their local computer. We give very conservative estimates for when they first hit and load the graphics of a site; those are the only numbers. We sell no matter how many people go back and forth — that's just extra gravy. Also, you have seen the banner. If you see it again in 10 seconds or a minute, is there another impression? You've seen the banner. We sell very conservatively, which I think is in our best interest.

A lot of people compare these CPM numbers -- they compare CPM with buying traditional print media. I remember a time five years ago when you could buy a 30-second commercial on CNN for \$500. Why? Because they didn't have the numbers in place. They didn't know how to measure. Once the numbers came in place, the ad rates went sky high. Intuitively, I know those people are out there. I am watching it. I see other people.

For \$500, how can you go wrong? In my thoughts, it's that kind of pricing [that's good], where I make the pricing of the site so attractive that it's a no-brainer so they can't afford not to do it. If you don't do it, your competitor might take it at that price. I would price my site very attractively because you're not just selling your ad site, you are selling a medium. You have to help them into selling the site. You might even have to help them with a marketing plan, and show them a promotion as we did with USA Data. Don't just dump them to your Home Page, give them something of value from your core business.

M: As a user, I am very aware of the agonizing factor of how long a graphic takes to load. Do your designers track how long it takes to design those graphics?

Larry Chase: It depends on what kind of site. It depends who you're talking to. If you are an insurance company marketing to middle America and they are dealing on Prodigy at 9600 or America Online at 14.4, you'd better make sure those graphics are lightweight. If you're more general and you are basically talking to other commodity people in the financial sector, people who are sitting on T-1, the big fat phone lines, you can probably up the graphics because you know that your target audience has the bandwidth to bring those graphics in fast. If it takes you longer than 30 seconds for this screen to resolve, you probably don't want to continue and you are not a likely prospect. You won't be interested, because it will be a very, very slow-load site. Maybe yes or no; I don't know if I agree with myself. I argue with myself endlessly.

M: You were talking about the CPM, and you said use the figure of \$20 per CPM. Could you just explain your CPM for the figures that you gave — \$3,000 to 5,000 per week, and you getting \$1,000 a month — how does that calculate?

Larry Chase: It's expensive. Mine is expensive. The question is, based on the CPM model, what are we charging at WDFM? The answer, off the top of my head, is that I don't remember. I think it's something like \$75, which is considerably higher than \$20; but again, it's like B to B, business-to-business publication. It's more of a qualitative buy rather than a quantitative buy.

When it's consumer goods like a car or an 800 Flowers, more people are apt to be qualified customers for that. You get volume savings because there are so many people out there when you are in a niche. If you go into those trade books, they get pretty defined because they are targeted to very hard-to-reach audiences. Again, \$1,000 a month in the overall scheme of things just isn't a lot. We look at it more like the cost of what a sales call would be.

If USA Data gets 10 people — you have to believe that out of 5,000 people a week, more than 10 people have clicked in there and maybe got in touch with USA Data. If they get 10 prospects out of that, then it's not the cost of advertising, it's the cost of sales.

M: [Inaudible]

Larry Chase: We saw that the Dutch site didn't do that. You had to denominate in guilders. There are various sites that only sell, and they say on their site, "Only within North America," or "Only within the United States and Canada."

Most retail sites that I have seen, like CD Now and PC Computing, are denominated in dollars because they expect to sell mostly, I think, to American and Canadian customers. That was the first European site that I have seen that denominated in another currency, because it's clearly aimed at Dutch-speaking people. I think the idea is neat enough put it in English and — using cybercash or e-bucks — to let me bid on that.

M: [Inaudible]

Larry Chase: How much are search engines charging? How much are they charging for specific words? I spoke to one company here at the show, and they were charging something like \$1,000 a word for a month with a three-month minimum. So if you wanted to buy the word "flowers" — you asked a very good question. I asked this specific question: If I buy the word "flowers," do I get "flower"? Do I get "flowery"? Am I buying the root or do I buy each word and every derivation? No, you buy the whole word for \$1,000 a month for a three-month contract. If you want to buy the word "flowers," you can buy that for \$3,000 for three months.

What some of the search engines will tend to do is mix it in. It's like churning butter. For example, with Hotel Discount on *InfoSeek*, he is up there with a six-month contract. He has a mix of about five or seven search words; normally you get five. You get a certain amount of search words with your basic buy.

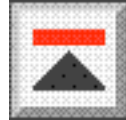
If you buy half a million impressions a month, how many of those will be for the word "hotel" and how many will be for the word "travel"? Obviously *InfoSeek* cannot guarantee that half a million people next month or three months from now will ask for the words "travel," "hotel," "accommodations," or "reservation." He can guarantee that the balance that doesn't will be thrown into general rotation, so there's a general awareness of the brand out there. You can buy gross impressions. You can buy the word uniquely, or you can buy a picture, or both.

M: [Inaudible]

Larry Chase: As my lawyer says, that's not a question, that's a conversation. I don't know. It depends on each — the question was, what mix of budget between on-line promotion, direct-marketing promotion, regular newspaper, other media, off-line promotion — what mix is appropriate? The answer is, off the top of my head, that it depends on each individual situation. I don't think what 800 Flowers does is going to be nearly the same as what Liberty Mutual's going to do. Liberty Mutual will do a lot more industrial advertising in the trade books. They serve certain vertical industries. They probably run ads with the Web site in the books that they are already running advertising in, ones that supports that particular trade. How much do those books cost? That's an irrelevant question to 800 Flowers.

We are now out of time. Thank you.

WORLDWIDE WEB A RETAILING CASE STUDY: PC FLOWERS



SPEAKER

William Tobin

President, PC Flowers & Gifts, Inc.

William Tobin: Good afternoon. My name is Bill Tobin, and I am the President and Founder of PC Flowers & Gifts. I have been a technology entrepreneur for — I originally had 28 years, but I read it on the plane and did some numbers, and actually it's about 31 years, so I've changed it. The only disadvantage is you have to be 10 days older than dirt to say it.

All of the companies that I have founded fulfilled a niche in an emerging market for several years; in the case of PC Flowers, eight years before it became "en vogue." Their success has been based on the philosophy of offering a product or a service that is extremely unique, and at a level of quality and service so extraordinary that a consumer would not consider utilizing a competitive service.

I would like to think that my magnetic personality was the reason that I have been asked to deliver this speech this afternoon, but I acknowledge the fact that I am probably one of the few people who have a six-year, successful case study in the interactive marketplace for your review.

My goal this afternoon is simple. It is to pass along to you as much of the knowledge as possible, in order to have you avoid the mistakes that I have made — and the mistakes that I have viewed others make — in applying their products to serve the interactive market and the Internet.

I became interested in interactive marketing in 1987 and searched for a unique service in order to be part of this new and exciting industry. I co-founded PC Flowers in 1988, and went live on the Prodigy network in November of 1989. It is with great pride that I can state that PC Flowers has been named by many major industry and business publications as one of the most successful interactive providers each year for the past six years. PC Flowers has received numerous awards, but more important than the awards — and this will be near and dear to the hearts of capitalists — it has been profitable for five of the six years of its existence. That cuts to the chase.

Many of you small and medium companies can appreciate what I am about to say when I state that titles and perceptions change with the times. In the seventies I was known by large corporate America as a parasite. In the eighties I became a "value-added" partner. In the nineties I am Entrepreneur of the Year. I haven't done anything different; the only difference is in the mind of corporate America. Strategic alliances are now absolutely viewed as the way to go.

The era of strategic alliances has arrived with a vengeance with the era of the Internet. Many people are reluctant to change when things are going well; it's a business paradigm that has been in place for many years, and it's working. The old saying, "if it ain't broken, don't fix it," no longer holds.

The revolution in interactive marketing and technology has taken place and now dictates that you change in order to be part of this revolution. Be judicious, but do not procrastinate. That reminds me of a story of the ninety-five year old couple who went to their lawyer and said, "We would like to get a divorce."

The lawyer said, "You're ninety-five. Why have you waited this long?"

"We wanted to wait until the children were dead."

I urge you not to wait until your commercial child is dead or wounded. The Internet is like a train leaving the station: nobody knows where it's going, but you had better be on it.

Many people believe, as I do, that the key to success is to carefully form strategic alliances directly with strong technological partners in order to market your services, or to carefully form a strategic alliance with a gatekeeper or a marketing partner who will function as your marketing partner and gatekeeper for your particular product.

Once again, the key word is to form these alliances carefully. Alliances are almost tougher to get out of than a bad marriage. The decision as to which of these paths to choose depends totally on the strengths of your company's resources and the amount of these resources you are willing to commit in order to launch and support your on-line service.

Here is an example of what can be accomplished when an individual service provider forms a true partnership — boy, those are keywords. A partnership is the only way that it's going to work. When I first went on Prodigy in 1990, the first year we processed 24,000 orders, and that was considered astronomical at that time. Unfortunately, it's still considered pretty good six years later. This year, because of the partnership we have developed with Prodigy, we processed 30,000 orders five days before Mother's Day. It's an amazing, quantum leap.

I honestly feel that I am, at this stage of development of PC Flowers & Gifts on the Internet, exactly where I was in Prodigy in November 1989. I believe electronic marketing is in the embryonic stages of launching a metamorphosis that will change the present paradigm through which many manufacturers are marketing their products and services. I believe you are now witnessing the early stages of a shift to utilizing electronic marketing to bypass their traditional channels of distribution — i.e., retail and wholesale — and go directly to the consumer. This started in the retail industry when a company like Levi Strauss or Nike went directly to consumers with their own stores in malls right next to stores selling their products.

If you are a retailer, now is the time to ensure that your company is a part of this paradigm shift. If you are a manufacturer, it is imperative that you explore fully this shift and ensure that your company is in the forefront of this revolution.

I am constantly asked why PC Flowers & Gifts has been successful in the field of electronic marketing while many others have not been successful. I will attempt to summarize my observations. I feel that the same rules that I am about to go over for interactive marketing and on-line services also apply to the Internet.

PC Flowers & Gifts developed the technological infrastructure for customer credit card processing and order delivery from the ground up, so they support our interactive service only. The mistake I view over and over again are retailers and traditional direct marketers who dust off their present operation and try to place a square peg in a round hole and say, "This is our interactive offering." It doesn't work. Everything is different.

A strategic alliance with a marketing partner or a commitment on your company's part to develop a strategy for your product is absolutely essential if you are going to succeed. The consumer is more involved in interactive marketing than he has ever been in the past.

For example, the consumer error rate in the retail floral industry, when I started this company, was five to seven percent, and remains so today. This is acceptable in a paradigm where the consumer gets angry and calls your 800 number and complains, or he doesn't order from your catalogue or doesn't come into your retail store. You can develop an enormous marketing program and goodwill program over the years. However, you anger one interactive marketer, and he goes onto a chat service, and he basically can destroy you.

The capabilities and the power held by on-line consumers is awesome. Regardless of whether you have the best product, the best service, the best marketing program, the best prices, you must have a flawless process, a customer support and delivery system, in order to ensure your success and your ability to remain active. It's a very unforgiving industry. Interactive

consumers are far more demanding than traditional consumers, and service providers must offer a caliber of service and quality that is absolutely acres ahead of any other paradigm.

This is due to the availability of bulletin boards, chat services, and anonymity that cyberspace offers to these consumers. They also expect spontaneous service and response. A hundred companies have gone on-line and have all failed. Unfortunately, the number of services that succeeded are very small.

For instance, on Prodigy, the two most successful ventures have been PC-FM and PC Flowers. Interestingly enough, both of these companies were formed from the ground up to develop an interactive service. I believe that played a great role in the fact that they were two successful companies on that service.

I congratulate Alan Meckler on his huge success. I spoke at his first conference in 1994 and his second conference in San Jose. I think there were 20,000 there [at the second conference]; the first one had 10,000 and this conference, less than six months later, now suddenly I am told there are 35,000 signed up to participate, with another 10,000 floating through. In a couple years this will be a Comdex. I believe the Internet is worthy of all your thought processes and resources.

Two years ago, in marketing my services on the Internet, I had problems that didn't exist in the past. I no longer had the use of highlight screens, main menus, exit screens, PEM, all the marketing tools that I have come to rely on. I didn't have the ability to cross-pollinate all my promotional programs. I sat down and started to design the marketing tools and technology requirements that I felt would be necessary in order to produce a successful commercial environment on the Internet.

These tools that I developed were as follows: a totally secure order processing and payment processing, which could be used as a standard for security on the facility. Eventually [we developed] a secure environment for service providers as well as consumers. PC Flowers began taking secure credit card transactions in April 1995 utilizing Netscape, and will continue to work with companies such as IBM, Netscape, and many others on future enhancements to increase the security of our order processing system in the future.

I am constantly deluged with people asking me how upset was I when I heard about the Netscape break-in the first time, the second time. I simply say this: to the members of the press that believe negativism sells, give us a break. There's never been an industry that hasn't had minor setbacks that they hadn't overcome. I say to you, if as much money was being poured into cancer and AIDS research as is being poured into the security of the Internet today, we would not have those two diseases twenty-four months from now.

I also ask you to think about the last time you picked up an 800 number and called and gave your credit card number to an operator sitting who knows where, putting it in a database to who knows who, or the last time you gave your credit card to a waiter who went in the back room and did who knows what with it.

The perception of security on the Internet is completely distorted by the press. I further submit to you that if you have the unfortunate experience of having your credit card lifted, you are not responsible. Your maximum exposure is about \$50, if that, and most of the time it's nothing. The guys that are really exposed are the service providers who ship the product and don't get paid when the credit company says that it was not a valid transaction.

I believe you must earn the right on the Internet to present your commercial message to the consumer. You don't have a consumer that has agreed to have his mailbox invaded, and agreed to look at commercial messages by virtue of the fact that he has signed up to pay \$14 or \$9 per month for a service. I believe you must develop — I coined this phrase — “communities of interest” on various subjects such as gardening, cooking, sports, sailing, golf — what a person's interest is. Those are the necessary items to generate traffic.

One of the few pieces to the mosaic that must be put in place immediately, if a consumer is to utilize your community of interest, [is that] you must have earned the right to present your message. If a person is using my community of interest, which is developing now in gift-giving, I have earned the right to tell that consumer about a gift that is available on PC Flowers for that particular event or for that holiday of the year.

Unfortunately, my evaluation of the financial and the personnel environments to manually develop and maintain numerous communities of interest is difficult. It was out of my reach and out of the reach of most companies. I basically formed a strategic alliance with a company that had a global reach and had vast technological capabilities. It was at that point I developed a turnkey solution for my company on the Internet, not one where I would develop it as I went along. Before I went live, I would have most of the pieces in place.

After careful evaluation of numerous possible strategic partners, I chose to go with IBM. IBM agreed to build the tools which I would conceive of and help me create the turnkey solution to my Web site. They would have the ability to then take those tools and go out and sell them to other service providers, because what worked for me should work for everybody else. My problems are not going to be totally unique.

In addition to gaining the use of these remarkable tools, I would benefit from the creation of an umbrella which would enable my service to reside with other service providers in the same IBM Web server. This technical umbrella would provide the one-stop shopping environment that I believe is attractive to consumers on the Internet. This umbrella would also provide me with marketing partners with which I could develop cross-pollination programs and start to duplicate some of the efforts that I have been doing over the past six year in on-line services.

Basically, for the past two years I have been thinking of tools and I have been thinking of content. The last thing on my mind that I was concerned with is graphics and navigability of site, because I knew that we were not going to have traffic in the sites until I got the tools implemented.

For the past two years I have been developing the content, and when I completed that development and the tools one month ago I retained one of the premier design firms for interactive design in the world, Magnet Interactive Studios in Washington, to completely redesign all the graphics and all the navigability. It will be event-driven rather than category-driven. We will use push-pull through Netscape as opposed to using these hexagon boxes, and that was my creation. In the first meeting they said, "Whoever thought of hexagon boxes?" So it's going to be replaced.

My first category is problems I have had for the past six years in shipping flowers to 161 countries directly through the FTD Mercury Network in the United States. I use only 7% of the FTD members who contract to me and operate according to my quality control and delivery requirements. We have our own order processing center in Downers Grove, Illinois, where we download from all on-line services on the Internet. We do the credit card processing, and it goes directly to my preferred vendors.

I have broken all the categories down, and I will just quickly give you an idea of what they look like when you go to them. We have a graphic in order to avoid the problem that most people who order their flowers by calling a local florist have — they have no idea what they look like. They have no guarantee because the local florist isn't responsible if something happens at the other end. If your credit card goes back, it's not deliverable.

Through our service, basically we tell you within an hour if there is a problem with your credit card. If you visit your mom on Christmas, the flowers — if the ones we sent you weren't really fresh for Mother's Day, we send a dozen roses. If the order isn't delivered, my preferred vendor calls the daytime number of the recipient, and we figure out how to get it to you. In

addition, most people think there is a tremendous premium by the fact we are considerably cheaper than the local florist.

The next paradigm that I recently developed this year is what I believe everyone has ignored, which is the fact that growers who supply wholesalers who supply retailers had a burning desire to go directly to the consumer. These growers are bigger. They arrive nine days fresher and considerably cheaper.

What I have done is develop this first program that you will see here. I have been testing it for over eight months, and I can tell you that the prices are incredible. There are still reasons why local florists have advantages. Due to the fact you get an order into my network by 12:00 midnight, we can deliver the next day through the Mercury Network. I can't do that through growers. I can't ship arrangements, other than the cut flowers, through the grower, because everything's going to FedEx. FedEx has a chute that every product goes through, which is hard on the flowers.

The next category is stuffed animals. We just developed a whole line of stuffed animals, plush animals. We developed a whole line of plush animals for events, with costumes on them and so forth.

The next category is gift baskets. It's a tough category; this category is very difficult to fulfill, because you need a large company who is ready to ship a real diversification of products within a few hours. We put together East Coast baskets, West Coast, ethnic baskets for the Italians, etc.

The next category... I feel that in the 90's the commodity will be time like the commodity was money in the 80's. I want people to be able to come and set their table from soup to nuts and not pay more going to Hickory Farms or a catalogue. It's succulent: fish, poultry, desserts, specialty products, nuts, etc. So if you decide, for instance, that you wanted to have a seafood dinner and you wanted smoked salmon or salad to start off with, you plug that in. Then go back and say, "Okay, we want this for dessert. We might want something unique. Let's pick something like ice cream truffle for dessert." No matter what you choose, it arrives in a temperature-controlled container the next day at your front door, and you have your dinner party with no additional expense than if you bought through catalogues.

The next category form was PC Balloons. I created PC Balloons. My delivery infrastructure is my retail florists, but we ship one balloon arrangement for every floral arrangement.

The next-to-last category... I had a desire to be able to duplicate the 10,000 Create-A-Card kiosks that American Greetings has throughout the United States, [and put it] on your PC. Heretofore, the only way you could send greeting cards was electronically to people's mailboxes, which works if the person has a mailbox, and if they were on a network. But my mother, and probably your mother and many people you know don't have a mailbox.

So with much work over the past couple of years, my marketing partner of choice for this category was American Greetings Company. What we have done is that we have duplicated American Greetings card kiosks on a Web site which allows you to bring up a greeting card. You can go in and say, "When I am finished with this greeting card in a nanosecond, I would like you to print it out in Cleveland, and I would like you to put it in an envelope, put a stamp on it and address it for me and have it arrive by U.S. post office within a few days, the same as if I did it myself." You now have that choice.

By the second quarter of 1996 I will give you a second choice, which is basically to say I would also allow the extra, "and I would like the card to arrive with my gift basket, with my Teddy bears, with my flowers, with my gourmet food gift, at the same time." We will be placing [this ability] at Create-A-Card kiosks and Hickory Farms, those two locations there, and at the grower.

I also felt, because of the vast [number of] consumers on Internet — IBM has given me the capability, through electronic tools, to avail myself of unlimited communities of interests with very few people. These tools have the ability to reduce the head count, which is necessary to perform this sale, this customer support, and to basically reduce the support by 75% over a telephone paradigm.

I have also designed nine invasive marketing tools, such as the gift reminder, which reviews very effectively for the past six years and allows you to have your choice to remind yourself of various holidays and for custom events. That gives me the unique capability of having your permission to go into your mailbox to remind you of various events.

Flowers and gifts are very unique. Time and time again, we have partnered with various companies in on-line services who send personal digital messages to the consumer. We have the consumer come back saying, "Don't you do that again." When we send a message reminding somebody that it's Christmas, Mother's Day, Secretary's Day, whatever the case may be, that they can send flowers. Flowers are like mom and apple pie. Nobody gets angry.

The next area is that you provide communities of interest on various subjects. The electronic technology tools which IBM designed allow me to go through all the electronic informational services on the globe and bring back the most frequently-asked questions and answers on a regular basis.

For instance, we have said that people wanted to know about roses. We have developed the tools, and given it parameters to go out and find the most frequently-asked questions and the answers on the electronic sources of information on roses. If you wanted to know about a particular question on diseases on roses, you would be able to get these answers on these diseases.

The next and biggest problem on the Internet is traffic, and how to get people into your site. How do you get them there? I simply asked myself, "What has made us successful on the on-line services over the past six years?" It was really very simple. All we did was get a highlight screen, main menu, and an exit screen to remind people what the next month's holiday was, and allow them to jump from that icon directly into our service to place their order.

With all that in mind, why don't I develop a program? I will call it "The Internet Consumer Incentive Traffic Program," where I will take a year's worth of GIF files, place those GIF files at an address, and I will go to the largest Web sites — I would place those GIF files in one address, and I would allow our marketing partners, who would be the largest Web sites on the Internet, to be able to go to that address on a monthly basis and be able to pick the GIF file size and style that fits their particular availability on their Web page for that month. So if it's December, my partners will go to this file and view all the GIF files that I have got available, and they will choose which of the GIF files best fits their style for that particular month. Underneath the GIF file they will then develop a program that is unique to them; maybe they have a membership acquisition program that month, or they want to get you to view a screen or perform a service or function within their site. Or [perhaps they want to] develop promotions — like a dinner for eight for that particular holiday, flowers for the whole year on every major event, or \$5 cybercash due upon anyone who does this for our marketing partners.

We then allow the consumer to hyperlink directly from this GIF file to my Web site. We assign an electronic token automatically to that consumer, which tells us where that consumer came from. When that consumer shops, the token drops, and we identify which of the on-line services were Web browsers or sites that sent consumers to us, and at the end of the month we compensate that Web site with a percentage of the sale.

These tools have been developed by IBM over the past year and the entire program is presently underway. I believe that this ability to cross-pollinate traffic is the future of the Internet. There is no one that's large enough to stand alone on the Internet; you must develop

marketing partners. We tested this program on Valentine's Day last year and on Mother's Day with Prodigy, Mecklermedia, and *Pathfinder*. You will have an opportunity to listen to Bruce Judson after me about *Pathfinder*; after I am finished, Bruce will tell you about one of the most successful Web sites on the Internet. To date we have 32 marketing partners we have developed, and the tools will be completed at the end of November that coincide with the redesign of our Web site, maybe.

I feel that the categories we have got are absolutely the very best. Basically, I hope I am able to develop a clone of PC Flowers with PC Flowers & Gifts on the Internet. We have expanded our initial concept of the floral arrangement, because I believe I must continue to go to the next level, no matter whose chain you rattle. I was not elected the most popular guy by the retail floral market; however, it's my responsibility as a financial marketer to give the option to the consumer and to develop the paradigm, make it possible, and give him the choice. If I don't, somebody else will.

We will be adding additional categories throughout the years. I believe the six years of interactive expertise that I have gained through PC Flowers and the vast technology of IBM and the marketing partners that I developed will help me to secure a successful commercial environment on the Internet.

The tools which have been developed from my turnkey solution are now available to you through IBM and various other companies that have developed and could work for you as well as they work for me. You have a choice; I will be demonstrating the turnkey solution at the DMA conference in March, and also at the next convention in San Jose. You don't have spend two years developing them.

Thank you for the opportunity to present this speech, and now I will take questions and answers, and the best question gets to send a dozen flowers, and the worst question — well, I'll tell you that later. Thanks for your time.

M: Do your marketing partners have exclusive arrangements with you?

William Tobin: Yes, they do. Do my marketing partners have exclusives with me? Yes. I have spent too much money. You shouldn't put all your eggs in one basket.

M: What kind of feedback did you get from your florists when you opened this new service with the growers?

William Tobin: What type of feedback did I get from the retail florists when I opened up directly from the growers? Well, they loved it. The retail florist paradigm is that FTD had 85% of the wire service and now it has around 40%. Basically, the rest comes from supermarkets who are using the grower, and also comes from electronic marketing. It comes from all these alternate services that are available to the consumer. Everybody is arguing over that same eight-inch pizza in the wire service business, and in some ways it's better. The consumer must have a choice.

M: [inaudible]

William Tobin: Is my product offering restricted to U.S. buyers? Yes and no. I can't ship fruit or food overseas. Yes, from the standpoint of view that I can take a floral order today, and I can have it to any country in the world, 160 countries, tomorrow. That opens a new opportunity. One of my marketing partners is AT&T Interchange, and we were just discussing at a meeting this morning the opportunity for business-to-business applications where they're marketing

their services to businesses. One major brokerage spent \$7 million on flowers. Business-to-business applications for florals and gifts is enormous.

I am one of the few companies in the world that can take an order from you today and have it in China tomorrow for a \$15 service charge. Your alternative is to buy the gift, fill out the papers and ship it FedEx. We give you the ability to ship overseas.

M: [inaudible]

William Tobin: The on-line services traffic is enormous. On the Internet I wasn't concerned about traffic. If you are concerned about traffic — put traffic behind you, don't even think about traffic. Don't think about sales. Develop your technical processing and customer support. Develop your categories. Develop your content, develop navigability, then graphics. Then worry about what your traffic is. Forget about traffic. Right now, for most people, the Internet is not a commercial environment for speed. I believe within 12 months that speed will be a non-issue because of the ADSL, which gives T-1 capability, cable companies to give you access, N-12 speed. It will be a non-issue.

Second is security. Within 12 months, and probably much sooner, security is a non-issue. Once those are out of the way, if you are there first, and you have spent the time building strategic alliances, building the best services and best content, then it's time to start getting traffic.

M: What kind of investment did you make to have your pages done, and what do you see as your return on them?

William Tobin: What was my investment to Magnet Interactive Studio Services and what was my return on my investment? Magnet would be very angry if I told you what I paid for it. It ain't cheap. If you go with the best, you get what you pay for. However, I think it was reasonable based on what they are bringing to the party.

What is my return on investment? Since my investment bankers are sitting in the audience, phenomenal. It's there. We got it back already.

M: What was the biggest mistake you made and how did you correct it with PC Flowers & Gifts?

William Tobin: I made an error in November 1989 when I set the company up and I didn't know that 93% of the FTD members were not capable of delivering to a quality that was required by an on-line service because they are in that 5% to 7% paradigm, and unfortunately I went live with 55,000 members on Prodigy with four items. One week into it I was called in by IBM and Prodigy and they said, "You'd better fix it or get it off." I didn't know that the smaller florist buys X amount, and when they run out they shut their Mercury machines off. When they run out of a container, they switch.

You are in a paradigm of "what you see is what you get," and you'd better know that your suppliers are doing what they have agreed to do. I had to quickly — I mean in thirty days — get on a plane, and I flew all over this country, networking all the major florists in this country. I got the top seven of the FTDs, which gives me coverage through every city in the United States, to agree to my terms and redo it, and I had to develop an infrastructure that allowed me to cut out the other 93% of the members. I said, "Wow, I should have stopped at 12 companies. This is a disaster." We did it.

M: What are the criteria that you use to decide which service providers are better to work with than others?

William Tobin: By “service provider,” do you mean category or by the platforms? AOL —

M: Platforms. I was wondering if you could give us more details on how you made those choices?

William Tobin: The question was, which service providers should you work with, and can I give any help in choosing the service provider? I made the conscious decision about a year and a half ago that it was not economically feasible for me to maintain a service on AOL, Prodigy, CompuServe, AT&T, Microsoft and the Internet. I made the decision that I would develop a killer Web site, utilizing the best designer in the country, utilizing the most innovative marketing technology developed. By utilizing the best designer in tracking, and database management tools developed by open market systems, I would develop the premier service of flowers and gifts. Most people don't realize that flowers represent 28% of all on-line transactions. Most people don't realize that the cut flower market last year was \$15 billion in America, twice the size of the Yellow Page industry and twice the size of the cellular industry.

I would try and develop a link to those services as opposed to — it's not feasible to change your product into all different codes for seven different services. I can't do it. Maybe you can if you have one item. The key is you have to develop a killer Web site. [Thank you.]

WORLDWIDE WEB EFFECTIVE MARKETING ON THE INTERNET: A PUBLISHER'S EXPERIENCE



MODERATOR

Ken Lane

WWW and On-Line Information Consultant

SPEAKER

Bruce Judson

General Manager, Time Inc., New Media

Ken Lane: Welcome to all of you here. Just to establish some format for this afternoon's session, we will have our presentation first and there will be plenty of time for questions and answers afterwards.

We'd also like to remind you that there is a CD being produced for the proceedings of the entire conference with audio tracks for each of the sessions. You can probably get more information about the pricing and availability of either of these two items by [going to] the administration area on the second floor.

And now I'd like to introduce our next presenter: Mr. Bruce Judson. He is the General Manager of Time Inc. New Media, a division of Time, Inc. His responsibilities include developing *Pathfinder*, Time-Warner's home on the Internet, which was launched in late 1994 and is now one of the highest traffic Internet sites in the world.

He is also active in creating interactive marketing applications for the Full Service Network, Time Warner's information superhighway.

Bruce is the author of *Effective Marketing on the Internet*, a cover article in the Summer, 1995 issue of *The Advertiser*, the magazine of the Association of National Advertisers. He is in the process of writing *Net Marketing*, which will be released in the spring of 1996 as part of the best-selling [Net Book] series produced by Random House. He is also a frequent speaker at industry conferences on multimedia, and is a member of the Board of Directors of Open Market, Inc., one of the leading suppliers of software on the Internet.

Bruce is Vice Chairman of the New Media committee of the Magazine Publishers of America Association. He's also Chairman of their task force on Internet ad measurement, [which is] leading the industry's effort to develop appropriate Internet advertising standards.

Earlier in his career, Bruce served as Director of Marketing for Time, Inc. magazines and Director of Target Marketing for Time, Inc. Prior to joining Time, Inc. Bruce was a manager of a Boston consulting group. While there, he helped to found the New York office, and was a leader in developing the firm's consumer marketing practice.

He has a Law and Management degree from Yale and was Senior Editor of the *Yale Law Journal*. [He was also] co-founder and Editor-in Chief of the *Yale Journal* on regulations. Bruce is a member of the New York Bar Association and a 1980 graduate of Dartmouth College.

He's quite a guy! I'm sure you're going to enjoy his presentation. Without further ado, ladies and gentlemen, colleagues, Mr. Bruce Judson.

Bruce Judson: Thank you. I'm not sure even my mother could give that complete a description! It is a pleasure to be here. It's a particular pleasure, and particularly exciting to me, because we have recently reached a milestone for *Pathfinder*. Last week was *Pathfinder*'s one year anniversary. For us, it has been quite a year.

A year ago I never [would have] thought that if I said to people, "well, what I do is run a site on the WorldWide Web" that they would know what I meant, much less that they'd be interested in talking to me and that I'd be popular at cocktail parties.

It gives me a real sense of how far the Web has come and what kind of extraordinary evolution has taken place within the last year. What I want to do today, very briefly, are two things. First, really, is to show you a little bit of where we've come with *Pathfinder*, and a little bit about where we're going, kind of as a media product and as a facilitator of commerce on the Internet.

Second, I thought I would give you a brief overview of some thoughts about how we see marketing and commerce developing on the Web.

Again, marketing and commerce, like *Pathfinder*, are something that not only did not exist a year ago, but I would say that the notion of advertising as a form of marketing on the Web virtually didn't exist six months ago.

Yet today we have companies — there's a whole host of exhibitors in the hall — that have businesses built around ad measurement. They all accept that this has become a business and that there's something going on here. I want to talk a little about that and also about how we see it evolving.

As I said, *Pathfinder's* evolution has affected several key initiatives. We launched *Pathfinder* a year ago with four content areas: *Time* magazine; a product we called the *Virtual Garden*, which drew content from Time-Life Books; and *Sunset* and *Southern Living* and other Time, Inc. properties, [including] *Live Magazine* and an area from Time Warner Electronic publishing, which is Little, Brown, and Warner books. It was essentially launched as a grand experiment in electronic publishing. After the launch, what I would say the most striking thing was is that we quickly realized we liked what we saw. We liked it from two perspectives.

As an information source, as a journalistic company, we were excited. Our journalists were excited because they were looking at the Web and thinking, "this is another creative place; this is a place where I can do something different, where I can exercise my creativity, my responsibility to society, provide information and entertainment. We can develop this new medium to really be something."

We were also excited because our own kind of excitement with the media was validated by the Internet community. We were immediately popular. As was said in the introduction, *Pathfinder* is one of the single most visited sites on the Internet; we are at approximately 17 million hits a week and are continuing to grow at quite a dramatic pace. It's also worth noting that one of the things that we're kind of excited about and proud of is that this is all pure word-of-mouth. We have not promoted the site in our magazines and we have not done any advertising. This is just pure Internet phenomenon at work, building this popular site.

All right, so what does it look like today? This is essentially what *Pathfinder* looks like today. What we've done is made a decision. In early 1995, as I said, we put it out, and it was an experiment. We looked at it and we made a decision in early 1995, and we said, "we are excited, we're going to build this out as a commercial product." That build-out reflected three phases.

First, we decided that we were going to broaden and deepen our content. Those of you familiar with the site know that at this point it runs about 70 distinct areas. I'll show you a couple of them. They represent an incredible collection of interests — some of the most familiar icons in America today. I'll talk a little about where we're going with those.

Second, last spring we said we want to understand more about what's happening here. We launched Registration First, and we also launched ad sales.

What is remarkable to me, as I've said before, is that when we launched ad sales there were questions [such as]: Would the Internet community accept paid advertising? There were issues. How would we be accepted? Would we be blamed? All those kind of notions. I'll talk about how we felt about that, what we saw and what we see coming in the future. In fact, we

did it the way we felt the Internet community would accept it, which is that it was non-intrusive. We view advertising within high-traffic media sites as a non-intrusive invitation for the consumer to come in and visit that advertiser's site.

It's just like a magazine, where a consumer can say "I'm interested" or "I'm not interested." They can accept that invitation or choose not to accept it. By building it out in a non-intrusive way, which we felt was very consistent with the Internet community and the ethos of the Internet community, it was quickly accepted. In fact, it's popular. I'll talk about that in a little bit.

Finally, we've said that next year we are going to start charging for aspects of *Pathfinder*. Ultimately we believe that, as a publishing company, this is a dual revenue stream vehicle.

As I said, this is a partial look at what is in *Pathfinder*. It's everything. It's a little bit tough to read from *Time Daily*, so it's an opportunity for *Time* magazine to move from weekly to daily journalism. There's *People Daily*, which is a critical read for many people; *Money Magazine*, which is all about personal finance; and the *Life* photo center, which has a really terrific area on the Beatles right now. [There's also] *Sunset*, *Southern Living* and *Sports Illustrated*. What I think is important, though, is that these are not simply magazines on-line. Our vision, and the way we are moving *Pathfinder*, is to serve readers' interests on-line.

An interest in personal finance, an interest in sports — it's our goal to ask, "How do we serve that interest on-line?"

Now, that may mean that you have access to the magazines. It may mean that portions of the magazine are hyperlinked, re-edited or re-purposed. It also means that you're probably going to want to have applications that are specific to personal finance, to sports and so on. We've found that people are interested in talking to with experts, and editors are seen as experts. So, we are moving to say, "these are distinct interest areas, and they are anchored by some of the greatest, most familiar and best put-together information pieces and icons in America."

But they are something distinctly different, and I think over time you will see that difference. The interactivity which is increasingly being facilitated by the Web will become even greater. In fact, we start to do things — like our sports area is now called "Sports from *Sports Illustrated*," because we want it to be clear in the consumer's mind that this is a very special, exciting interactive application built off *Sports Illustrated* and *Sports Illustrated's* creativity.

All right. Over time, I think what you're going to see is deeper and richer material. There will be more figuring out what people want on-line as we serve those different interests, as well as bringing up additional interest areas.

What I want to do now, actually, is shift our discussion. Let's move very briefly to a discussion of the evolution of marketing and commerce on the Web.

What I think is that there are a couple of things that have happened. In a sense, the first phase of the Web media and marketing on the Web is now very well along. I'll talk about that in a second.

In fact, what's also happened is that the Web has been recognized as the place for marketers on-line. What you see moving around those circles are America Online members, Prodigy, Internet MCI, Microsoft Network, and now AT&T WorldNet and eWorld and Delphi. Essentially, if you are a marketer and you put up a Web site, anyone who is on-line can read you from anywhere. That is not true if you put yourself on a proprietary service. That is one of the essential reasons that the Web has caught on so quickly as a marketing vehicle.

We think it has very clearly become the place on-line where, if you're a marketer, you go. It's also got all kinds of advantages if you're a marketer. One is that you control it; no one owns the Web. You can put up whatever you want.

You can change it anytime you want because there's no one that's setting ground rules. You know, I used to think that was a problem; this is chaos, nobody sets any rules here. Then I decided no, this is the great strength of the Web. It means that people are constantly experimenting for what is interesting, for what is going to move people. It is constantly rising; there's nobody setting rigid formats.

What you see is terrific marketing: getting an audience, moving forward. As you would expect, there's also a lot of yucky stuff, really awful stuff, and people don't go there. And that goes away.

So the unruliness of the Web, in a sense, has made it a hotbed of marketing experimentation. That is one of the great things about it. There's also no charge. If you are a marketer, you're typically used to thinking in terms of, "What it's going to cost for fifteen seconds? What's it going to cost me for thirty seconds on a medium?"

This is exactly the reverse. There's no limit in terms of time and space for what you pay. There's no cost in that sense; there's no media cost. And you could, in theory, easily put up thousands and thousands of pages. So you have an entirely different challenge.

That challenge is: How do I create something that is engaging, that holds a consumer? The consumer comes to my page. If I'm not exciting, if I'm not interesting, they're gone. But if I can bring them in, if I am interesting, if there's some information that they want about me, they might stay for a half hour, or whatever the appropriate amount of time is. It's an entirely different way of thinking about the media. It's no longer, "what can I do in the limited amount of time or space that I have?" Given no constraints on that, it's now "What can I do that is interesting, that is helpful to the consumer, that the consumer is looking for?"

All right. As I said, about six months ago we would have said there were probably 20 or 30 of the top 500 companies that had Web sites. They were probably very technical and not consumer-oriented.

Today, a quick look says that about 25% of the top 500 companies in sales have established marketing-oriented Web sites. People are moving quickly to get into this environment. I would also say that if 25% of the top 500 are up, at least another 25% of the top 500 are in development. They'll probably be up in the next three or four months, because virtually everywhere I go people talk about how they're about to turn on their Web sites.

This is very quickly becoming a mainstream strategy for the nation's marketers. As you would expect, it varies a lot by category. So far, 50% of telecommunications companies are up, while the numbers for automotive and travel are smaller. Certain packaged goods products are even smaller. We think that over time all of the different product categories are going to move into the Web, particularly as the Web audience broadens from what was a technical base to a much more mass base. Throughout 1996 there's likely to be an increasing number of sites established.

Why has it been such a popular thing? Well, I talked about the ability to experiment, but that's the marketer's perspective, not the consumer perspective. What is it, if you're a consumer, that makes the Web a great marketing vehicle?

We think it's a couple of things. I like to say it is the world's greatest 800 number. By that I mean: You've got someone sitting at home. Let's say you've got the typical American [home]; let's say a two career family, kids, overworked, tired and not enough time. It's 10 o'clock, it's the fall, we haven't planned our holiday vacation yet — we'd like to do something. What are the family's options?

Well, they can pick up the phone, dial an 800 number and call for some brochures. They have to wait for the brochures to come, though, and they have to find the time to look at them, think about what they want to do, and then make the decision. So, they have to wait for both for the delivery and then be back together in that buying or shopping mood.

Alternatively, they can go onto the Web, visit the Club Med site, gather in-depth information about each site and find out which site meets their personal needs. Increasingly, sites are geared toward telling you how to find things that are relevant to you personally.

In this example, let's say [the family wants to decide] which Club Med is good for kids. They can make a decision about where they want to go, and in some cases, depending on the site, actually reserve on-line or at least know what they want to do and then pick up the phone and make that reservation. Within an hour, somebody can go in, investigate a product on an in-depth basis, and make a convenient decision anytime within a 24-hour period.

It's a storefront that's always there. That's also something that people talk about a lot. Americans are living, working and doing things at different hours. The ability to shop, get product information, interact — or whatever phrase you want to use — at any time of day or night is also incredibly valuable.

Consumers do buy things. They want to know things. The Web is an opportunity to give consumers in-depth product information. They can get it at home, which they like. They control it; they like that also. People talk to us a lot about concerns [regarding] talking to intermediaries. There's a group of people today that want to increasingly educate themselves before they go out into the world and start talking with agents and others. The Web gives that ability.

It is also the ability to have a real interactive sales environment. You can say to somebody — someone can come in, say, to an insurance site. It might say, "What kind of insurance are you looking for?" You might say, "I'm interested in life insurance." It might ask "What kind of life insurance?" The person might respond, "Explain the differences to me."

You can take a complex product, which normally requires a very long sell with a person, and if you are marketer and can think out the questions, what the different paths are that people are likely to move down, then you can anticipate those questions and create choices. You can move someone down that tree-and-branch architecture and actually bring them very close to a sale.

I do want to make the point that you can also reverse that. It might not be the kind of insurance you are looking for. "What kind of person are you? Have you recently had kids? Are you recently married? If you recently had kids, here's the kind of insurance we recommend for you. You should have disability [insurance]; you should have life insurance."

"Oh, tell me why, what's an appropriate amount? What kind do you recommend?"

People do want that kind of recommendation function. They know that it's coming from someone who wants to sell them something, but it doesn't matter; they are still interested, particularly when it's presented in an appropriate way where they feel they're getting good information.

It's an extraordinary consumer convenience. It really is the bottom line. I tend to look at this a lot — and we'll talk about that in a minute — like an ATM. Ultimately, the ATM skyrocketed because it was a good consumer interface. It was extraordinary convenience, and that's really what marketing on the Web, and shopping on the Web, are all about.

It is the ability to create a one-to-one relationship with the consumer. You can begin that dialogue with the consumer. The more you can anticipate what a consumer is going to be interested in or asking, the more you can make that dialogue relevant to the consumer.

There are also some really interesting things going on in, kind of what I'll call "one-to-one" or "dialogue" marketing. I'll give you some examples of that in a second. We'll talk about how we think it's going to evolve.

Now, what is also fascinating is when you asked me six months ago, "What is marketing on the Web?" I said some of what I said to you, which is that it is in-depth product information. It's ultimately going to be the ability to sell someone something. In fact, what has quickly

happened is it has become much more than that. Marketers today, companies today, are doing a whole range of things that I kind of think is worth really noting.

They're doing things to build their brand; they're actually creating an image on-line. The Ragu site, which is the Mama Cucina's Ragu site, is very famous. What they've done is positioned that brand as an Italian product. In it it says, "learn how to speak Italian." It's really given it a sense of life and image.

Ben and Jerry's has gone off and said, "We're a fun place." Snapple has a very distinct image on-line. So people are really using the Web to build brands.

If a consumer dials into you through the Web, you don't have telecommunications costs, so people are saving and will continue to save extraordinary sums of money. You don't have the 800 number calls and you don't have the personnel costs associated with that 800 number, so when you can move to an order-taking system on-line, on the Web, it's a huge savings. It also can be a vehicle for more effective and low-cost customer service. And that's one of those win-win situations.

Think about customer service. I call; if there are not enough operators I either have to wait or it's really — you know, there's always enough operators and it's more expensive for the company. What happens is, in the right case, I can go on-line. Again, no 800 number charge [to the company], and I don't have to wait. And if it's a good interface I can go in, find out what I want and get taken care of. I'll show you an example in a second.

There are companies that are literally saving millions and millions and millions of dollars by providing customer service through the Web. They're also providing a more effective customer service than they were through the phone. People are beginning to do sophisticated promotion and building databases and potential customers that they can deal with on an on-going basis. That's kind of interesting. I'll show you an example of that.

Really, I kind of think, what is the ultimate? The ultimate, or one of the ultimate things, is if you can think, "What is my product? I have this product. Is there something that I can do on the Web that actually makes my product more valuable to somebody?" And there are, again, examples of that starting to emerge. People are actually using the Web to make their very product better. And finally, you can use and create intelligence as I talked about, those one-to-one relationships. I'll show you some examples of that.

All right. What I'd like to do now is go through a couple of examples that can give you a sense of some of what I've talked about, a hint of what the future will be like for marketers.

Customer service has been one of the central competitive battles, if you will, of the early 90s. What I really mean is that people have come to expect extraordinary service. If they don't get extraordinary service, they go somewhere else.

A well-known customer service example for those of you — and for people who are not familiar with it — is Federal Express. You can go in, type in the ID number for any package that you have in the system, and it will tell you where that package is. Is it in transit? What happened to it? When can expect arrival?

That's all an automated system. So again, I think it's safe to assume that FedEx is both saving millions of dollars on people who are no longer making phone calls, and they are providing a superior service. Because, you know, I don't have the hesitancy of calling. There's still a thing of people don't like to bother other people. There's a feeling of bothering people when I get on the 800 number and [ask], "What's happened to my package?" There's not that hesitancy here. And again, there's no waiting, in the event an operator's not immediately available. It is instant service.

This is an example, to me, of the really interesting promotion, database building, creative activity that's going on in the Web. The Cathay Pacific site has recently launched a business

class service from Hong Kong to L.A. What they said is, "We're going to have an auction, no minimum bid, for 50 seats over the Thanksgiving vacation — round-trip, Hong Kong to L.A."

So what's going on here, from my perspective as a marketing analyst? First, the creativity was really interesting. I saw auction and I thought, "Wow, that's kind of neat," and it drew me in.

That's one of the things that I think people increasingly need to focus on. What kind of creative icons are going to draw people into the site? Once I came in, it read, "You can bid." This is impossible to read, but it says, "You have to register, and when you register, then you can bid."

All right. What's going on? You kind of figure that anybody who bids any significant amount of money is a real customer. They are somebody who is interested in going back and forth on this to Hong Kong. Now, Cathay Pacific knows who they are. They even know, kind of, a little bit of assessment, what someone's willing to pay to do that. When you register, you give them your e-mail address, and they do say they may contact you in the future with future offers. I think that is a critical thing, in a sense that this is a kind of direct marketing, but the dynamics are entirely different.

The dynamics of direct marketing are typically: what's this going to cost me to do this mailing; and, is it going to pay out on its return? Well, here, if I know someone's e-mail address, it's a cost-list mailing. But the last thing that people want is junk e-mail. I think that is one of the central etiquettes of the Net. Don't send something to someone without their permission.

People, when you talk about privacy, have a very strong sense of wanting to maintain their privacy. But when you register for Cathay Pacific, they're very up-front. They let you know about specific offers they may have.

I would also say that if you bid some significant money to travel round-trip to Hong Kong, if they have a special promotion or special offer to Hong Kong, you're going to be interested in it. You're not going to be upset to receive [the information]. So what are they doing? They've created some really interesting ideas; they're building a database of prospects, they are experimenting with a new form of sales.

That's something else that the Net may ultimately create. There are a lot of products for which prices fluctuate. Auction sites are beginning to develop on the Net. If you start to think, "I suddenly have a pure market of millions of people who are looking to see what's available and people who want to sell things," then auctions may actually become a means of sales, as a mainstream sales vehicle. I don't know; all I'm saying is that it's possible. This is both a promotion and, in my mind, an experiment with that kind of new potential sales vehicle.

All right. Another issue: Why hasn't there been more buying of stuff on the Internet? What happened? This is "Shoppers' Advantage," but you may know them as Citibank Shoppers' Advantage. They tend to partner with credit card companies. You join for \$49 and then you can buy up to 250,000 name-brand products.

They've recently gone on the Web, and there are a couple of things about this I think are exciting. First, again, no telecommunications costs. It used to be you called an 800 number. Now I go in and they're not bearing that cost anymore. If you are familiar with this service, you call up and you say, "I'd like to know about this microwave and it's this brand." And you tell them what you want to know, they tell you the price, and you say whether you want it or not.

Typically, people have a thing about, you know, "well, how about the next price up, the next price down?" There's a kind of human reticence to keep someone on the phone to say, you know, "I want to know about every possibility."

When you're on-line, and I actually went through this, I found myself saying, "I went in to see how it worked," and then I said, "Well, what if I want that television. What would I have

to pay for the next one up, and what would be the features? How about if I wanted to pay less?"

That kind of hesitancy is a human feature. Without costing the company anything because of an 800 number cost, I was able to really check out all my different options, and I could feel better about the decision I might be making to purchase. In that sense, I would argue very strongly that what Shopper's Advantage [provides] on the Web is a superior product to what they do by offering you a catalogue with a limited number [of items].

And necessarily so, because you can't put 250,000 products in a catalogue and then have you phone in your order. The Web actually allows you to create a better, more consumer-friendly, effective product. And the other thing I think is important, before we leave Shoppers' Advantage, is that the Web is a terrific source for information. We'll talk in a second about transactions.

A lot is not being bought on the Web. There hasn't really been a lot of stuff to buy and there haven't been brand names. Brand names are an indicator of trust. You kind of think of GE, or whatever kind of brand name resonates with you, "Well, if they're there, and I can get that, I'm not worried."

So bringing on CUC which has brand name products, as well as others that are coming on with brand name products, is going to make a significant difference in the evolution of actual purchasing on the Web.

This is, to me, one of the most interesting sites that's come up. It's a bookstore called amazon.com. They sell over a million books. Their discount — they have some pretty significant discounts, but that's not what's most interesting to me. What's most interesting to me is they've created what they call, "Eyes and Editors," which is a personal notification service.

Eyes is your fully automated, totally customized book. It's a highly anthropomorphic search agent, and it can let you know whenever there's a release of new titles that will be of interest to you.

So, what's going on here? You come in, you register for Eyes and you say, "You know, these are the authors I like, this is the kind of book I like, these are the kinds of books I like." And if they've got those authors, when that author comes out, they'll send you an e-mail that says we now have this available.

They've got a relational database. So if you said, "I like this kind of book," they'll send you an e-mail saying "Have you checked out this book?"

PC Flowers, which is terrific, has a service that's similar in the sense of — I think it's an anniversary reminder or it's a holiday reminder. So again, you give them kind of personal information about yourself, and in return they provide you with a service that is very, very valuable to you.

The other thing that is critical here is what they call the "Bill of Rights," and that is about privacy. They indicate right up-front, no-holds barred, "We're not doing anything with your name. That's our promise to you. Anything you tell us stays with us."

That, I think, is absolutely critical. There is no question that people today have enormous concerns about privacy, about whether information being given out on-line is moving around. We at *Pathfinder* promise we're not going to do anything with that information if you register.

When we started selling advertising, the first thing we said to advertisers is: "You can ask the consumer yourself. And if you set your site up correctly, the consumer will volunteer information to you."

But we promised that we will not pass any information about you. We — and I think everyone else in the industry, too — have held to that strongly. Because the need for privacy is a very, very strong feeling for consumers out there today.

All right. There are lots of activities that are here today that are forerunners of the future. All of it is just a glimpse of the customer service order-taking, the personalization that you can expect to see from marketers and marketing sites in the future.

Now, what else is going on? Well, as I think most of you know, the Web is getting crowded. Ten thousand new commercial domains are being established every month. It used to be that if you went up on the Web with a site, that in itself was news. People would check it out.

I was talking to a reporter who covers the on-line industry the other day. He said to me, "You know, I get about 40 calls a day from people who tell me they're putting up a Web site." I said, "Terrific. Send them to me."

But the point is that it's no longer news to put up a site. And it is no longer a guarantee that if you have a site, people will come to it. It's like having an 800 number that nobody necessarily will call. So, today — and an 800 number has no value if no one calls it — you increasingly see people who, as they're putting up their sites, are thinking, "Well, how do I also publicize my site? How do I build awareness? How do I get the word out?"

There are different ways of doing that. They range from hyperlink in high-traffic editorial sites — and that is essentially what is available in *Pathfinder* where you have lots of traffic moving through — and as I talked about before, [there are] non-intrusive invitations for consumers to go in and visit the site. Maybe today I wasn't thinking that I was going to investigate buying a new car, but I saw the icon and I thought, "this looks interesting. I'm thinking about in the future, at some point, I'm going to want to do this." So it's both awareness — I said, "Oh, they're there" — so now I know this marketer is on the Web. And it's certainly easy. With just a click, I can check out and see what they have to say.

[What's] another reason someone visit an advertiser's site? I get asked that a lot. Well, there are a couple of reasons. First, the Web is inherently a curious medium. People are here to explore. I do not think that as the Web becomes more of a mass place, that's going to go away. People have information needs. They want to buy things; they want to buy appropriate things. So they are both curious [about the Web and] they're interested in information.

Also, marketing has become a part of the experience. Marketers have begun to think about entertainment and creativity. How do I create value or a fun experience? And that's one of the challenges that right now marketers are facing. What is it? If I'm trying to sell something, everyone knows in the real world that [you need] a shopping environment that people like. A lot of people have theories. I want people to hang out. They hang out, they'll buy something.

The new Barnes & Noble stores in Manhattan have cafes and couches and chairs. They're built around the idea that if people come, and I set up a community, they'll hang out and ultimately they'll buy something. The trick, which everyone is facing now, is what is that in cyberspace? What is appropriate? How do I mix in some entertainment? Or, if I'm actually trying to create a transaction, what kind of mix of information, entertainment and product [should I use]? How do I display it? We'll talk about that in a second.

[Now let's look at] Web addresses in print ads. A year ago if you had put in a print ad "http," no one would have known what it was. Today, if you look at the Sunday movie ads, fully 50% of all movie ads are tagged with the URL, and it's becoming just like an 800 number. You're going to see it more and more. Basically marketers are saying, "Just like my 800 number, here's a place where you can go to get more information about my product."

It's a two-step kind of marketing. You see that kind of ad, it gets out the URL, and then you go into the Web for the detailed product information. And you're seeing that both in print and even on television. There are Web publicity campaigns. As you launch on the Web, you figure out what kind of sites are going to be interested in me, who's going to say, "Oh, this is now available!"

How do I let them know about myself? A couple of very quick examples. When one of our sister companies with Warner was launching *Batman Forever*, a month before the movie went out we put up a site. At the launch of the site, they took ads at the bottom of the *New York Times* where normally people kind of talk about anniversaries and other important events.

They said, to [inaudible] villains who plan on Gotham, <http://batmanforever.com>. We believe that was the first time a URL was on the front page of the *New York Times*. You went in, and what you found is tough to see here, but it was *Batman Forever* and Gotham City. As I think most of you know, *Batman Forever* had the most successful opening weekend of any movie in history. *USA Today*, in its reporting on that, said that one of the reasons was this site.

We talked about hyperlinks. At the bottom of *Pathfinder* [you see] "Prudential Securities," and "Win a Sable," and you see those are hyperlinked if the consumer is interested. If that kind of catches the consumer's attention, and they decide to accept that non-intrusive invitation, they click on.

Now, in this example, they've gone into Prudential's virtual branch office. One of the issues on the Web is that hyperlinks are a form of direct marketing. Increasingly, it kind of sweeps the industry. Marketers think about them as a form of direct marketing. [The idea is] to experiment in ad location, to experiment in creativity. And the idea is that pure corporate logos are likely to be less and less effective.

What you're trying to do is [think]: how do I get that consumer interested in going through the door, into what's behind the door? Well, you want to give the consumer a sense of what's behind the door. There's something exciting behind the door; there might be something different behind the door.

At Marketplace, MCI sponsors the *Interactor Daily*. At one point I noticed if you go there every day, they were starting to rotate their ads. And it's very clear they are rotating the creative [part] simply because there's obviously a belief that it's proving out. They're continuing it and that will lead to a higher yield. If people didn't respond to that creative, they'll respond to this creative, or maybe there's something different there. I have a very strong interest in saying, "We would love for you to rotate your ads, because we think it's going to increase your traffic."

When you evaluate your placement in *Pathfinder*, you're going to be much more of a satisfied customer. So, the interest of the people who are selling advertising — and the people who are buying it — are absolutely aligned in this case. I mean, you're going to see a lot of activity here in the next year.

[Here's] another: Say I Love You with Roses. An exciting thing.

I'm going to make a contrast here. Initial research that we've seen says that consumers who are on the Web do use it for product purchase decisions. Research that was done a couple of months ago said that for people buying things, they used the Web to get information about software or about hardware. Now, those were the areas of the Web where marketing is most developed, particularly several months ago. That was where there were the most sites. You would expect that to be the leading edge.

That, to us, was a validation of everything that I've just said. I want to contrast that with actual transactions. In our minds, there is a very significant difference between giving someone product information, helping them make a product decision, and the actual purchase on-line.

While 65% of people said they were using the Web for product information for software and hardware, only 15% said they actually bought on-line. And there's a whole variety of reasons why that is. Secure browsers have only recently become available. There's also a question about public perception of security. Not whether there is security, but does the public believe there's security?

Second, as I said, there hasn't been a lot to buy. Until recently, there have been few brand names on-line. The catalogs — and I think this is like the catalog boom — initially started because prices were more attractive. In the early 90s you bought by catalog because it was cheaper. Well, today it may be higher quality, or more convenient or a whole range of other things, but initially, to develop that channel marketers had compelling prices. Until recently, marketers on-line had not been giving consumers back the benefits of their lower costs through this channel. That's held it back.

Women do account for two-thirds of purchases in the United States, and there have been fewer women on-line. In general, it takes time for new habits to develop. It took some time for the ATM to catch on. I think one of the things I would say is that it's very unclear if the Internet is definitely established as a place for information and product purchases. It's an incredible place. I believe that ultimately transactions will explode, and ultimately, those transactions will be enormous.

But it may take some time. And I don't think we should think that in three months or in six months — of course in Internet terms that's six years — but we shouldn't necessarily believe that in three or six months you're going to see an enormous range of transactions. It may take a little while, because you are talking about establishing a fundamentally new consumer habit.

It does have the convenience. Like the ATM, people will figure out how to create a terrific environment for consumers to shop on-line. Like a real store, they'll see what works and what doesn't. And that's what marketers are struggling with. Ultimately, it is going to be enormous.

Okay. As I said, like the ATM, it will ultimately be enormous. All of the issues that are holding it back are going to disappear over time. You're going to have brand names; you're going to have secure browsers; you're going to have marketers who are experienced in how to interact with the consumer, which is what they're trying to figure out today.

In general, consumer use of the Web itself is going to grow. The timing is something I think no one knows. So, if I was going to wrap up, I would say that the Web is going to continue to evolve rapidly as a place for marketers.

It is becoming a mainstream medium, [both] for influencing product decisions and as a mechanism for low-cost communications with consumers. That includes order taking and customer service. "Let me tell you about an on-going relational discussion. Let me tell you about the latest products that might be of interest to you." Transactions are ultimately going to be enormous. Widespread purchases, as I said, may take some time.

That's all I have. That's as much as we've got time for. I'm open to questions.

M: [inaudible]

Bruce Judson: The question is, do we print the full text of the magazines? How much work is involved in moving from print to putting it on the Web? Typically, it depends on the publication as to what extent we publish the full publication or rely on selections. I don't have a simple answer there. The work is really putting it in HTML and then [deciding] how much design work you want to do. You can put a lot into creating terrific designs. or less work. It's really a site by site, publication by publication issue. Are there any other questions?

M: [inaudible]

Bruce Judson: A week. We've been very public about our advertising for 1995. We wanted it to be simple; it was \$30,000 for a quarter. And an advertiser rotates through *Pathfinder*. We think

that is about four million page views a week, which is kind of a currency of advertising. We are registering — but are not requiring authentication — every time someone comes in. So no, I cannot give you an estimate on the number of people. We've got some ideas, but we're going to wait until we really know to release those numbers.

M: [inaudible]

Bruce Judson: The question is about how the publisher makes money differently in this mode. We do not believe that there will be a tremendous difference. We believe we are putting tremendous resources into the creation of *Pathfinder*; the site itself changes every day. And it is a value issue. Consumers will pay for high quality, unbiased editorial. So there will be a dual revenue stream supported by consumer revenues, and by advertising revenues, just like a print version.

M: [inaudible]

Bruce Judson: As I said, it's a value issue. We believe that we are creating, and will create, products that the consumer [wants]. The consumer's going to decide. And the consumer is going to ask, "Have they done something that's so neat?" We believe we will create things that are valuable enough that consumers will say, "Yes, of course, I will pay for this. It's worth it. It's the kind of high quality thing that I want."

M: [inaudible]

Bruce Judson: Sure. The question is, what is MPA — Magazine Publishers' Association — talking about in terms of ad measurement? Have we seen any killer systems?

We have been talking today at more of a theoretical level. Two things. One is that if you operate a site, it's your responsibility to get it "counted." That may mean you have your own software, it may mean you use someone else's software.

But, which turns out to be the killer system? The thing that we have added is that we feel it is appropriate to have another layer which is an unbiased, third party — like an ABC or someone else — who is auditing those results. You're going to have a very competitive market for counting, so we want one auditing of what the sites are reporting.

Second, we would like to have, if nothing else, a common language. Today, you have hits, page views, quick streams, users, active users, registered users — and for most people there are probably five different definitions of each of those. For the whole ad industry to move forward we need a common language. What is a page view, what is a user, what is a visit?

M: [inaudible]

Bruce Judson: No. No. We would not use it without — sorry. We said we're not giving out information to advertisers that's individual, specific. The question is, are we going to use it ourselves? And the answer is no, with one exception. You may see from us, at some point, a question that says: "Would you be interested in offers that have this characteristic or that characteristic?" If you say yes, we will e-mail them to you. If you say no, you won't see anything. So, if we use them, they will all be used in response to your statement that you're interested in receiving information from us.

M: [inaudible]

Bruce Judson: Stay tuned. I'm sorry; the question was, have you thought about developing an electronic version of a reader response card where you can get information back from advertisers? I guess I would say the answer there, to that specific question, is no. If you're an advertiser in *Pathfinder* it means you basically have a Web site with in-depth information. Our notion of advertising is that we give someone the option of going there and visiting that site. But there are some related things that you may see in the service in a couple of months. There are some things like it that we are thinking about.

M: [inaudible]

Bruce Judson: The question is, what are the legal ramifications of putting other businesses names and addresses on your Home Page? And I guess I have to say that I don't know the answer to that. I'm being told the answer is "none." All I will say is that all of our advertisers, of course, sign a form saying, "We want this link, we are supplying you with this artwork," and that's the artwork that we are putting up.

M: [inaudible]

Bruce Judson: There is a defined schedule and you can also define the areas that you want to move. Oh, I'm sorry. The question was about rotation on *Pathfinder*. How do we define that rotation? And the answer is that as you sign up to be marketer on *Pathfinder*, we work with you to develop an appropriate rotation schedule because there may be certain sites that are likely to attract the type of demographics you want. So, you may want to rotate to certain areas and not other areas. And then you also get a certain rotation through a high-traffic area, like the Home Page and others.

M: [inaudible]

Bruce Judson: The statement is, I am one of those users who detests passwords and IDs and registration. So how are you going to control access? I think that is probably a short-term issue. In the near future your browser or whatever else you are using to go visit sites, will — if you have registered once — retain that information, or tell the site who you are. You yourself will not have to retype it in. I think that is a short-term issue that is going to be resolved by coming generations of technology that are not that far off.

M: [inaudible]

Bruce Judson: The question is about whether we're collecting demographics to identify prime times during the days, or weeks, for rotations on ads. I guess. We know when the service gets the most use.

All right. Thank you very much. I appreciate your time.

WORLDWIDE WEB
USING THE WORLDWIDE WEB FOR MARKETING:
THE SMALL BUSINESS PERSPECTIVE



MODERATOR

Ken Lane

WWW and On-line Information Consultant

SPEAKER

Jill Ellsworth, Ph.D.

Senior Partner, Oak Ridge Research

Ken Lane: I welcome you all. You look a little “conferenced-out” at this point in time, but thanks for coming. I’d like to give you a little bit of an idea of the format. We’ll have a presentation that will last about 40-45 minutes, or maybe a little longer, and you’ll have an opportunity for some questions and answers after the presentation. I also want to remind you that audio tapes will be available of not only this [presentation], but any other session that you might have missed; and there will be a CD-ROM available which will contain the entire proceedings of the conference. More information is available up by the registration area if you’re interested.

And now, ladies and gentlemen, it gives me great pleasure to introduce our next presenter. She’s a former university professor and dean, holds a Doctorate from Syracuse University, is a senior partner with Oakridge Research, is a consultant about business and marketing on the Internet for Fortune 500 companies and is a popular speaker in North America and Europe about business, marketing and education on the Internet.

She is the author of *The Internet Business Book*, *Marketing On The Internet* and *The Internet Business Kit*, which have been published by Wiley & Sons, and *Education On The Internet* and *The Internet Unleashed*. She serves on the Survey Working Group of the Internet Society and is an active, very active Internet participant.

Ladies and gentlemen, it gives me great pleasure to introduce Jill Ellsworth.

Jill Ellsworth: Boy, you hardly know what to say after something like that. Kind of scary.

What I want to talk about today is not only marketing on the Internet, but particularly the issues that hit small businesses as opposed to some of the big guys. They’re a little bit different and the solutions are a little bit different.

I just like this slide, so I put it up. It’s about the Internet. We talk about 30 to 50 million [Internet] users, but when we’re alone and talking to our colleagues we say, “We’re not too sure how many.” [With] 55,000 hosts worldwide and local networks hooking up to the Internet, the growth curves are amazing. I know all of you have seen those growth curves where it seems to go up to the sky, but in another life I was a statistics person and if you extrapolate all that, every person on the globe will be on the Internet in the year 2005. But we know that’s not true, so, so much for statistics.

I’ve been doing a lot of talking to businesses on-line, small and large, about what’s going on with that, what’s happening, how is it working? I’ve got one of those questions that I keep getting which is, “Is anyone making any money on the Internet?” You know, aside from people like me. And the answer is, “Yes.”

I’ve completed a research study with 460 businesses that are on-line, and I’ll tell you a little bit about that later. Then, after kind of gathering all of the general data, I talked to some people and this is one person that I spoke with — Faucets Online. Now, these folks sell really fascinating things — faucets and kitchen sinks and drains and shower heads and stuff — to other

businesses. They sell business-to-business pretty much, and for years they have had a really big catalog, pictures and pages that you turn, and then every time they changed the price they'd reprint this brochure and this catalog and it cost them a lot of money.

So they went onto the Internet to save some money, not so much to reach new customers; because, again, they're business-to-business, and if you want faucets they know you'll call them. But here's what Dan Sullivan said. He said, "We think we're able to show more of our products to the consumer than with any other medium. We're more on target with our market and we could show them more than they could find going to five or six different suppliers."

And they're thrilled not to be spending hundreds of thousands of dollars reprinting old brochures with one price change and then mailing those out.

So, Faucets is a good example of a business that is doing well with a Web page that's not all that snazzy. You know what I mean by snazzy Web pages? *Hot Wired*, [with their] pink colors, all those really great things. Well, that's not how the Faucets catalog is on-line. You find your product, you can move on down there and find it in chrome and brass and how much that's going to cost. It's really very plain and simple, but it serves their needs and their customers' needs.

Another person I talked to — and I get a lot of questions like this — people will say to me, "You know, are there any businesses that really shouldn't be on-line? Is it really wrong for some kind of business?" And the only answer I've had up until now was something like, "Well, my shade tree mechanic down the road from me probably doesn't need a Web page tomorrow; he may not even need e-mail at all." So, the answer has been something like this.

When I was doing my research it really surprised me to find Monty's Restaurant. Monty's is a small restaurant in Tempe, Arizona that has a Web page, and I'm thinking to myself, "Why do we need a Web page in Tempe, Arizona?" But, Monty says two things about the Internet. He says e-mail is the holy grail of customer service. He thinks it's absolutely terrific, and I'll tell you about how he uses UseNet groups here in a minute. Then he says his Web site offers the greatest marketing "bang for the buck" around anywhere these days. It's a little restaurant, and I said to myself, "I've got to talk to this guy. Let me find out what it is that he has to say about this, because it really surprised me." It turns out he does a couple of things.

He goes out on a UseNet group called "Phoenix Eats" where people talk about restaurants and local restaurants. He decided he better listen in on what his customers are saying, and so he now uses that as a way of finding out what's going on with his business and how it's going. And when he finds an unhappy customer, do you know what he does? He writes to them. He e-mails them and he says, "Listen, I know you had a bad time in my restaurant, I'd like to fix that, here's a coupon, bring your family and eat on us." But, he actually does find out what's wrong and what's going on.

And I said to him, "But still, what about this Web page?" He said, "Well, we're fairly wired in town and people use it to find my menus. They "clip" my coupons and they come in." He said, "I've been asking people if they're really using my Web page, and they are."

So, my assessment — that local business drawing local business may not need a Web page — I may have to think about. But I still don't think my mechanic needs to go on-line, either. That's my hunch. Here's Monty's down in the corner there. He has his restaurant in an old house, an old house that he's remodeled. But again, it's not a jazzy Web page, but you can clip the coupon. It didn't do me any good, I live in Texas.

SDG Insurance says after only five weeks that their Web site has paid for itself, and it's been the best advertising they have ever done. And then they compare it to a direct mail piece that they mail out, and what kind of return they're getting on that — 3%. Then they compare

that with their Web page, and they're getting a 10-12% return rate. I was kind of surprised about that.

I decided — with Jim, as well — to find out how things were going, and he said he really likes being on the Web because he finds that he gets more kinds of customers. He uses a data input form that he's able to then respond to, and he's getting a real good return. He's feeling real good about his investment and how that's working for him. He also uses e-mail — no surprise — to be in touch with his customers. And again, it's not a real jazzy page. It's very plain and simple; you do your data input, he turns it around and gets back to you. It's not anything fancy, it's not *Hot Wired* or hot colors or anything like that. He's certainly not using *Java* yet.

Well, let's talk for a second about how big the Internet is for the moment — because that's the only way we know how to look at it is by the moment, it changes so quickly. A couple of things I want you to think about, especially for small business, is that small businesses are finding that e-mail is very effective and that's very much in line with the demographics that we have.

The full access folks — those are the folks with the Web pages, the full Web access and so forth — this number is growing due to a lot of the on-line services, etc.

Then there's a middle group, who might have some of the other food groups of the Internet.

And then the largest group with e-mail. Small businesses tend to deal with other small businesses or individuals, and they find that this e-mail angle is extremely important to them.

Commercial domains are still growing. We don't know how much longer that's going to happen, but it's still happening. The commercial domain is huge. The WorldWide Web is growing and people say a hundred million by 1998. But remember, marketers, that they can't all see your Web page, and they can't all FTP and they can't all Gopher, but many of them can e-mail and one of the strengths for a small business is that e-mail contact, that getting close to the customer.

Who is out there? I was doing a speech at a conference yesterday where some of the CommerceNet information was being explained and talked about. There must be now, ten or fifteen or twenty on-line sources of information about who is on the Internet and on-line demographics.

At this point, I think the best thing to do is to look at them all, think about them all, and to ask yourself if you're a small business person, "Are my customers on-line, or are they likely to be in the next 12 months?" The problem is that I'll see a business that wants to go on-line because it's the neat thing to do; and it is, but I say, "Well, are your customers there, do you think, or will they be anytime soon?" And the answer is, "No, they're not there yet and no, they're not ever probably going to be there." Then I said, "Well, then a Web page is sort of like your own personal entertainment. It's not really going to help you with this marketing issue."

[There are] lots of issues around validity and reliability, as statisticians talk a lot about that stuff. But, what it means is that you should be cautious with any one survey. I'm not tarring and feathering them all; but it may not apply to another site or to you, it may apply to only the site where they took the statistics.

[There is] lots of talk about how many men and women are on-line. The information recently seems to be perhaps one-third women, two-thirds men. So if you're marketing to women, especially as a small business, you may need to go to some extra lengths in order to reach them.

Regarding age ranges, we have some in their early 20's and some in their mid 30's to 40's. Again, if you're going to be a small business marketing to folks in their 70's, they may not be on the Web yet for you. Although my dad is, so watch that.

The occupations, again, tend to be white collar, computer academic and so forth.

Income tends to have two humps, one we think for the new graduate from school who has had those [Internet access] tools and thinks of them as theirs, and second the sort of middle managers in their middle 40's, highly educated. Their Web tools have us look at the Web a little differently. Again though, perhaps one-third women, perhaps two-thirds men.

The average age seems to be around 35. Again, mostly in the technical fields and education.

I want to talk for a minute about a figure that I saw running around about average income on the Web as [being] \$69,000. As a person who does statistics you know there's facts and statistics and all that, and all those scientific ways of looking at numbers and looking at data. But this one I look at with my heart or my gut and I say, "I don't think that one's right. I haven't got any scientific proof, but I don't think it's right." I do not think the average income is as high as \$69,000. I think it's more like the \$35,000 to \$40,000 that we see. This all has implications for all marketers, but particularly for small businesses who almost always are hunting for a little bit narrower group.

So, why is a business interested in being on the Internet at all? Lots of reasons: communication, internal and external, corporate logistics sometimes, or even internal Web pages for the development of, say, personnel manuals and so forth.

The whole issue of globalization, reaching beyond your city, or your state or your country, or North America — those lines get very blurred on the Internet, and small businesses particularly have to be careful of that. If they're not prepared to fulfill orders, say for example in Canada or Mexico, or in Europe or in Asia, they can get into some trouble on the Internet by advertising that they have this stuff [for which] they can't fulfill orders. That's true of large businesses as well, but large businesses tend to have the resources to fix problems rather quickly, or have already solved that.

This next one is the place where you see, I think, the most value for small businesses being on the Internet and on the Web. It is the leveling of the playing field. You do see a lot of businesses on-line that are run from the back bedroom or from the basement office, or two people or three people or four people working together. If you do a real good job on the Internet and on the Web, they don't know that you're operating from your basement as opposed to the Trump Towers. That's one of those really competitive advantage things that comes through for the small business person.

Cost-containment is another area. Collaboration and development is very important for small business. Small businesses need to think about, instead of just a competitor, think of that competitor as a possible collaborator on a project that your business is too small to get; but together you can form a dynamite team for getting that bid or getting that business. Small business is very much making use of that.

Obviously, on the Internet there's tons of information, the whole drinking from the fire hose and just overwhelming kinds of things. And, of course, marketing and sales is one of the most obvious areas.

The globalization, the leveling of the playing field area is, as I said, one of the places that I think small businesses could make the most hay while the sun shines. They need to remember that it is international, that it crosses time zones and boundaries and so forth, and on the Internet you can gain some equality. I don't think you can gain perfect equality on the Internet; Microsoft and Bill Gates are still going to have a lot more money than you have, and can do more things than you can, but you could compete on certain things.

Marketing, sales and PR — this is one the areas where small businesses are really, really making a dent in their competitors and are able to compete very well. I call it "marketing through content," not marketing through empty messages. We do it for all the same reasons: the advertising, visibility, brand name recognition, all those things, the whole creation of a

business presence is there in the marketing and sales. You can do marketing research, and you could find out what your competitor is up to in some instances, especially if you hang out on certain lists. You'd be surprised what people will tell you on those lists.

We hit direct sales malls and on-line ordering. I'll give you my own personal assessment about malls; horizontal malls try to emulate a shopping mall. They don't seem to be doing very well for the small businesses — or for anybody else, for that matter. I don't know about you, but the reason I go to the mall is that sure, I go to shop and to watch people, catch something to eat, maybe a movie; and that's hard to do on-line. The vertical malls, where we have information and products all in one area, in one business, seem to do a great deal better.

On-line ordering is getting easier. You can put out product information, you can do customer service. One of the real strengths of the Internet is customer service, technical assistance of all kinds, public relations and community service. I want to remind you, as all kinds of business owners on the Internet, that you need to remember to give back to the Internet something interesting.

This is an issue I stress probably in every speech that I give, which is that when you want to do business on the Internet you need to become part of that culture. It's the issue of "When in Rome, do as Romans do." If you're trying to sell, literally, products in Italy, you must sell them in a way that makes sense to Italian consumers; and on the Internet you must sell these products or do this business in a way that makes sense to the folks on the Internet.

It's not so much a legal issue as a cultural issue, the issue of "in-your-face" advertising versus "marketing through content," and the issues surrounding spamming. We're getting a lot of that right now. I don't know about you, but I am.

When we talk about marketing engagement on a Web page, we want to talk about what's going to get people there to visit. We're going to give them something to do, some activities. We're going to do something useful. One of the slides I use to have here but don't today is FedEx. They've made [their Web site] useful, they've turned me into a customer.

There's the interactivity of contests, surveys, and becoming a member. Increasingly you're seeing Web pages that stress that the customer can give you some information and at the same time you can make them feel part of what you're doing. The marketing and information and the issues around content — it's an old saying, but with real estate you have the "location, location, location," and on the Internet it's at least "content, content, content." But increasingly it's interactivity and usefulness as well.

One of the pieces of research that I've been doing is looking at who're making money, and that's going to help you make for a success. And one of the things I set out to do is to interview some people whose on-line business did not do so well; you know, what we might call business failures on the Internet, or "road kill on the [Information] Super Highway."

One of the biggest things that I found was that these folks had a great idea, they had a really interesting idea for business — and had no sense about business. They did not know how to do business and so off-line or on-line, they would have not made it. They thought that by putting up a really snappy Web page they could kick back, put their feet up and wait for the customers and the money to roll in. It just doesn't work that way.

Of course, one of the big keys is getting your page registered out there on *Lycos* and *WebCrawler* and *Excite* and *InfoSeek* and *McKinley* and all those search engines, getting out on the discussion lists and using your SIG file and all those things. It's just really important, because I looked at a couple of business failures and I said to them, "Well, your page looks really interesting, how much business did you get off of it?" [They answered,] "Basically, none." So I said, "Well let me check that out." And I kind of checked through all the basic search engines to try to find them and I couldn't. So if I couldn't find them, and I'm pretty good at ferreting that

stuff out, think about your average consumer trying to do that. So some of these failures have had a lot to do with visibility.

[I've been] mentioning the search engines and so forth by name; there's lots more than this and there's more coming. Remember *Trade Wave Galaxy*, that use to be *El Net Galaxy*? Now it's *Trade Wave*, [*Witcern Commercial Sites Index*] and all that. Don't forget, if you have a Gopher, to have it registered with *Veronica*. I'm going to make a note on Gopher here in a second via FTP and the old, you know, "you help [me] and I'll help you."

One of the things that I discovered in doing some of this research about who's succeeding on-line and what's going on on-line with business is — and I don't think it's any surprise to most of you — that Gopher sites are going away. They're becoming a little bit dead. There are fewer of them that are really good than there used to be. I'm not ringing the death bell on Gopher, I'm just saying be aware that it's not what it maybe used to be.

FTP still seems to be hanging in there as a support particularly for companies that deliver information or software. It's a great way to do it and that's still strong, although I'm seeing a lot fewer text and information files on FTP. So that's kind of going on.

I encourage everyone to promote their Web sites with other media. I don't know about you, but I'm seeing a lot more URLs on TV. I'm seeing a lot more URLs on signs outside of businesses and I'm seeing a lot more of them on business cards.

I live near Austin, Texas and was zooming through town and the big entertainment center said, "Check out what's coming — [http...](http://...)" and I went, "Whoa, cool, very nice." And I zoomed off of the highway to go to the airport and saw Southwest Airlines, check it out, Harley Davidson, all of those things. You're seeing URLs in places that you never did before.

On CBS News, the day before yesterday, [there was] a big vote in Canada about whether Quebec was going to leave Canada or not, and I was interested in that. So, I'm checking this Web page all day. First of all, the "Yes" votes were winning and then things caught up and finally the "No" for splitting up won the vote. But, increasingly we're looking for that kind of information. Seeing your Web site out there providing some of that sort of information is real important. Don't think about URLs on radio too much, though. They don't work too well.

So, in doing this research, let me just summarize some of the things that I've found particularly for small businesses. Now, a lot of this works for big business too, but not every bit of it.

I say there are no invisible Web sites, so be sure you're registered. There are no dead Webs. You've seen them, you know who they are. You go out there and the site looks like no one's been there in a very long time, it's a ghost town.

New pages [should be] added, old pages updated and given face-lifts. Successful pages are information rich, with good content, often what I call "more than a visitor can absorb in one visit," because it gives them a reason to come back. Don't lose them, but do that.

They have clear navigation. Users can move through the site easily, arrows or icons are clear. Moving around seems intuitive; it seems the way you want to work it.

The next point is one that I can't see because of the lights, but I'm guessing that there are folks here from *I-Net Marketing*, and we've talked about this one on *I-Net Marketing*. Their pages do not funnel the user out too quickly. Do not send them away right away. I mean, it's like a story. You've got them in the door, do you want them leaving right then? I don't think so.

Make sure your links [going] out make sense. Do they add something to your site to have them out and try to bring them back? I've seen some very, very unsuccessful pages where the very first thing they do is, "Ta da, we're here." You know, they've worked hard to get your feet in the door and then they immediately send you away. I don't think that's the right thing to do. I'm for modest use of links out, and I think it's real important that you take care of that.

[Also, make sure that] the site has true added value. Now, this relates, in a certain sense, to my previous point. The previous point was: don't link out too much. Well, added value is not a whole bunch of links out. You'd be surprised how many people are doing it. It's real services, it's real content, it's real products or other resources. A site is not just a place to market and sell; it's a place to provide information, stuff for free and so forth.

Again, this is a part of this issue of, "When in Rome, do as the Romans do." Folks on the Internet expect to get some stuff for free. They're accustomed to that. They don't mind if you try to sell them something, but give them something, too. Give them some information, help them out. So, successful sites are not just for sales, they're for other reasons.

[Be sure that your] site maintainers are responsive so that you don't click there and find that dreaded "404 — URL not found." I don't like that either.

[Be sure] the site has organizational or institutional support, and is not run by the guys out back — it has a budget, it has all kinds of stuff. It's not dependent, like Blanche Dubois, "on the generosity of others." It has its own budget and has those kinds of things.

[Make sure] the site is capable of gathering information, and you can get stuff about your users. I'm not just talking about your logs, your logging and the site tracking stuff; I'm talking about getting people involved through newsletters, surveys, stuff like this, so you know who's been visiting there, their preferences and reactions. I saw a TV show last night, Nightline, about all the information that's being gathered on consumers; and I assure you it's going on on Web pages. But where you do know people's preferences and what they want, let's make use of that.

[I want] to reiterate a couple of things, like [using the Web as a] marketing channel with other channels. It's supported with other Internet tools; you have your e-mail set up and so forth, your bots and so forth, your automatic mail-out.

[Make sure] the site has good design. And there are just a few things that make for some rules of good design, which are no way meant to say you shouldn't do creative things; but make sure that you have alternatives for those really large IS maps, the ones that I call the "laundry IS maps." I can do my laundry while I wait on them.

Interactivity with real people is available. I was at a site the other day and I kept clicking and clicking and clicking to find someone to give some feedback to — forget it. It didn't work.

[Make sure] the site is sensible versus hot and that the graphics, design and colors are in sync with the corporate image. You know, *Hot Wired* is in sync with their corporate image; but if you have a site like hot-wired for 3M or Rolls Royce of Beverly Hills, I don't think so. It needs to make sense. It needs to make sense with your other imaging that you do on TV or in your other things.

[Make sure] that the site has some consistent imagery and content from page to page, so I don't feel like I've left your site all of a sudden because I don't understand the images that I'm getting.

[Make sure] the URL isn't funny-looking with the tildes and stuff. This is increasingly important for businesses — that I know their name. I was looking for a business the other day, a small business, and I hunted through *Yahoo* and didn't find them. I hunted and hunted and finally said, "well let me try "www.com" and so forth, and sure enough I found them. That was a good deal and I think that's important.

How does the little guy keep ahead using the Internet? Well, I say, "use the Internet." There are some issues that arose out of the research that I was doing for what made it so that the little guy, the small business, could get ahead. Here's what I found out from that.

They need to do what's called "helicoptering." Get above the fray and have a look at the big picture, see what's going on, scope it out. They need a headlight to look beyond the horizon and see what's over the next hill and around the next corner. The little guy needs, probably more than the big guy, to do their homework. Know the competition. Scope out what they're

up to. Form alliances. Again, as I said, if you think that you have a strength and your competitor has a strength, together you might be able to go after bigger jobs. Don't always think of it as a competitor. And you might not join up forever; you might only join for a while.

Make your site more dynamic or more creative. As I say at the bottom, you can't outspend them, but you can outsmart them, outfox them, and outmaneuver them. I mean, as I say, Bill Gates is — you know, the lint in his pocket is worth more than all the small businesses put together. You can't outspend Microsoft, but you might be able to be fast-twitch, nimble, what I call "ducking and running."

What many people use to be a small business — it's getting bigger. At Netscape, that's what they're good at. They have outmaneuvered, they have ducked, they have run, they have headlighted, they have done all of these things and they're about to make money, I think. Their initial public offering certainly went well for some of this. I was a stockholder for a little while; but I heard recently that they're about to do a dividend of about 4 cents a share. Well, they're making money, finally. They've been through an acquisition mode and now they're doing that. So think about those issues.

Well, we've got lots of "opportunities" regarding business on the Internet; that's what we say when we really mean trouble, or we like to call those "challenges." It's opportunities for problems as well. Here's where I think that there are opportunities for new businesses, and what on-line businesses need to think about right now.

Security data authentication transactions. [There are a] lot of folks hard at work on that. I think that for the most part we're about to solve the public's perception about some of the problems.

We are seeing an increasing number of what are called "spams" or "commercial e-mail" that is unsolicited, and I think we need to work on some ways to help the e-mail box holder solve some of that. We're seeing some changes in Internet culture from what we use to think of as the cooperative Internet. I was talking with a friend of mine, another Net old-timer, and we think that a lot of Net old-timers are engaging in rose-colored glasses. It was never that great. I can sure remember getting myself burned pretty good on-line.

But things are changing a bit, so let's look at that — figuring out who's on-line, who's our market, the demographics. I think we're beginning to solve some of that. The whole future is sponsorships and advertising. Will we have HTML tags that allow one at the top of a page? Will we figure out — and I think we will — how to change the ad depending on who's hitting the page and what their interests are? I think we're going to do that with the issues around "searchbots" and intelligent agents of all sorts.

There's the shopping agent, the information agent, and all of the things we want to do with bandwidths. I want *InternetPhone*, and I want it now. I want full motion video, and I want it now. We're going to have to solve some of those.

Who's in charge of the Internet? Nobody, but some folks would like to be. What we're doing with HTML, SGML, *Blackbird*, *Netscape*, all of those kinds of things, I call it "Clash of the Titans," although I don't think that Bill Gates would appreciate me equating Netscape with what he's up to.

What do we do about the bad parts of town? There are bad parts of town on the Internet and we need to think about ways of handling that without saying, "Let's shut it all down." I have a little bit of information, if I can find my sheet.

I just finished a study of information on who's making business on the Internet. I asked 400-something businesses that question, and 82% of them said they were making money. Now, I went into more detail than that, but I did want to know that from them. I asked them how many were satisfied with their return on their investment, and 70% of them were happy with that. Now, by return in investment they meant some things like growth and profitability,

obviously; but with especially small businesses, when they're growing they're rolling back their profits into the business so the bottom line may not look as good as the fact that their business has doubled.

I asked about how long it was taking for Web sites to return on their investment, and the average is around six months. That surprised me; I thought it would be a whole lot longer than that. In some cases it was as short as half a month and in some cases long as, they figure, 24 months.

I asked them how they figured that return on investment. They told me that [they figured it in] overall business growth and profitability. And if it was sales, they actually did a return on their investment based on dollar figures, customer responses and some of their site-logging data.

A lot of businesses on the Internet are small businesses, and 41% of the ones that I surveyed had one to ten employees, and a lot of them had these single guy employees — you know, the one guy who's there. Although, interestingly enough, where it was a very tiny business — the Federal Government says a small business is less than 500,000 employees or something. I'm always amazed at that.

But when we talked about the size of the business being from one to ten employees, about half and half were men and women. That really surprised me. I was amazed at that. Of course, as soon as we move up from there those percentages change radically to where, if the business has more than 500 employees, there were no women who were the head of the business. The rest were men.

I asked them about elements of success, and I had some of that at this presentation. The biggest element for success for these folks was internal support and actual allocation of budget and personnel. I think that's real clear from that.

I asked them to do a prediction. Now, they're on the Internet — these are businesses on the Internet, currently doing some sort of business, apparently successfully. I asked them how important it was for other businesses to be on the Internet, and 9% said it was of the highest importance, 24% said very important, and 38% said important. The rest of them said, "It's a dog, leave it alone." But, I was fairly surprised at that.

I have more data to crunch — that's what statisticians say they do with data, is they crunch it.

What I'd like to do now is to take questions. What I'll need is for people to be fairly loud with what they say, because again the lights make it so that I can't see anybody in the audience, so I won't be able to help call on people very well. Do people have questions that they want to ask?

Yes, go ahead.

M: Per your surveys, what percentage of the businesses are actually selling on the Internet as opposed to a catalog?

Jill Ellsworth: The question was, "Of the people that I surveyed, what percentage were selling from their Page or using the Internet to do business, to do marketing, and to do all that visibility stuff?" And it was about one-thirds selling, about two-thirds not selling of the ones that I surveyed, and I tried very hard to keep track of making the survey look like the rest of the Net. So, that was about where it was.

[Tape change]

M: [inaudible]

Jill Ellsworth: Okay, I do, actually. The question had to do with those that were successful, that were doing selling versus — I'll call it marketing. Let me look here. The levels of satisfaction were — for marketing, those using a page only for marketing, not to sell stuff — went something like this: completely satisfied, 16%. Very satisfied, 27%. Satisfied, 28%. Unsatisfied, 18%.

Those doing sales, they were skewed slightly less toward satisfaction with 14% completely satisfied, only 22% very satisfied and 31% satisfied. So, it was just downwards toward general satisfaction, as opposed to the higher levels. I think that has a lot to do with fulfilling the goals that you set out to do for the Page. If you're only marketing and doing branding, I think you're a little bit more likely to be satisfied than if you're actually selling goods, so that, "I sold 12 widgets and I'm not satisfied," or "I sold 12 widgets and I am satisfied." I think that's what it had to do with.

Other questions? Yes. Down here in front, the only person I could see.

M: How many companies go from inside to out?

Jill Ellsworth: The question was, how many of these companies develop their Pages inside, or outside? I have some data on that, but I'm not finished looking at it. I eyeballed it and it seems to me that the satisfaction came mostly for the people who put their Page on someone else's server and had some help setting it up. I've not got complete data on that. My anecdotal data tells me that's true.

There's a small percentage who created this all themselves and are quite satisfied because they only invested like \$200 or something, so they're going, "Yeah, cool." I think those are the people with half a month return on their investment on their Web site, but I'm not finished with that data yet. I wish I had it in a form that made sense, but I just haven't had a chance to finish it.

Yes.

M: How would 462 sites select [inaudible].

Jill Ellsworth: I'll rephrase that and see if I answer your question. He wants to know where I found the 462 businesses. For the last couple of years I've been trying to keep track of sizes and kinds of businesses on the Internet [that are] using it. I tried to randomize that in what's called in statistics, "stratified randomness," to meet those size criteria.

I actually sent surveys to around 510 business, but as usual there are some folks who told me to mind my own business and leave them alone — and then there were some folks who were trying to be incredibly helpful by not answering the question that I asked with the numbers and giving me a full-blown answer to that question.

So some of those I had to leave out, but I tried to achieve some randomness across sizes as I'd seen it develop across the last couple of years. I would be the first to say that one of the things you have to keep in mind is that it's a snapshot. It was done across the summer. It's no longer exactly accurate because things have changed.

Did you have a question?

M: [inaudible]

Jill Ellsworth: Oh, okay. Most of the search engines that I'm familiar with do one of two things: they either take on all comers — in other words, if you want to register your page at, say,

Yahoo, there's a data entry page and you put it in and in general, unless there's something wrong with it, they list it. Then some of them — my memory is on *McKinley*, I don't remember about *Excite*, but I do remember *McKinley* — they agree to rate your site and if it's okay they'll give it a rating and put it in their database. But, they're not charging you for that.

Go ahead.

M: Isn't there a way also that we can [inaudible].

Jill Ellsworth: Yes, and let me use *Yahoo* as an example. Let's suppose that you're selling faucets like our friends that were selling faucets; they're going to want to link under a couple of different areas like hardware, or bathrooms, or kitchens and so forth. And that's why doing the registrations yourself [is a good idea], instead of through one of these big, big *Submit It* sites.

I love *Submit It*, and I've used it, but my sense is you get a lot more accurate submission to a search engine by doing that by hand — that is to say doing them individually and doing them under the right categories. You know, as I say, faucets should have been under faucets and hardware and sinks and tubs and whatever else was available to them. And different sites will have different of those categories.

Other questions? Can't see you. Yes.

M: [inaudible]

Jill Ellsworth: I'm sorry, I couldn't hear you. Could you speak a little louder?

M: [inaudible]

Jill Ellsworth: Oh, in terms of security? I haven't dealt with that a lot, but most people tended to believe, most business tended to believe, that if they were careful they could maintain site security through firewalls and other things; but customer's perceptions were that it was less secure than it was. And I'm not surprised about that.

I remember when credit cards — you know, people tell me about when credit cards came out, that people were nervous about using them. And I remember being a little nervous about using an 800-number and giving my credit card number to that person, but I got over that real quick. I now do that a lot, and I also shop on-line and I occasionally send my credit card in e-mail. I know that there are those of you who are cringing in your seat when I say that.

Other questions that I can answer? Yes.

M: [inaudible]

Jill Ellsworth: I was offered \$8,000 for it at a conference yesterday and I just don't think that's the right thing to do. I'm not done crunching the data, which is why it wasn't in my presentation, but I had some of it and wanted to give that to people. My sense is that what I'll probably do is to put most of it up on my Web Page and will, most likely, share some of the rest of it with my consulting clients, but I don't intend to package it and sell it for \$500 a pop. I'm a Net old-timer, and that doesn't feel quite right at this point. So, you could look for some results shortly on my Web Page.

M: Do you do other types, or is that what you do, you generally research?

Jill Ellsworth: I do mostly marketing research, and in this particular case it was simply that I was, to put it bluntly, “pissed off” with hearing about over here the people who said, “You know what, no one is making money on the Internet.” And I thought, “Well, that doesn’t sound right to me.” And then I overheard people saying, “You know, everybody is making money on the Internet.” And I thought, “Well you know that doesn’t sound like it’s right either.” That’s certainly not the people I know.

I felt that it was someplace in between, and I felt as if, given my background, that’s something I could help to find out.

I certainly don’t think that my studies are the be-all and end-all; I think it’s the start that had maybe helped some bigger organizations get started on looking at this. We’ve done that with demographics, where we’ve gotten a lot of people interested, and I think that’s been very positive for marketing on the Internet.

I think this is a start at looking at the businesses instead of the users, the customers. Now, let’s have a look at the businesses — here some folks are making money. Some folks are making big money. Some folks are not making big money, but feeling okay about that.

Other questions? Yes.

M: Is there a way to find out how many people are on the Internet in terms of certain geographical areas?

Jill Ellsworth: No. The question was, is there a way to find out how many people are on the Internet by geographic area or in a certain geographic area? And the answer is, no. I think there are ways to estimate it, but not with a great deal of precision.

Now, let me tell you why I think that’s so. I’m “Our Lady of Perpetual Surfing,” and I have lots of Internet accounts. When people count, they count me lots of times; or my sister-in-law has an account with AOL, and she and her whole family are on and they think that’s one. Those are very difficult things to average out.

I would say the best data on that is from [John Quartermen] of Matrix Information Services, www.mids.org, and the Internet Society, that is isoc.org. I would look for that, but no, you’re not going to find out exact numbers. You’re going to find estimates and extrapolations.

Other questions? Yes.

W: [inaudible]

Jill Ellsworth: I can’t hear you at all. Come up and talk to me and then I’ll tell them. How’s that?

W: What’s the biggest mistake small businesses make when they go on-line?

Jill Ellsworth: Her question is, “What is the biggest mistake that small businesses make when they go on-line?” I would say that there are two mistakes that come right to the top. The first one is they put together a Web Page that’s got lots of blinking and flashing and funny background paper and all this, and you can’t read it. They have the classic blue-on-black letters. They don’t know how to do that. So that’s a mistake.

But more importantly, when they go on-line they have unrealistic expectations for what’s going to happen to them and fail to register, fail to make themselves visible.

Then, I guess third of all, there are businesses where their customers are not on-line and not likely to be, and a Web Page doesn’t make a lot of sense. So that’s three. I mean she asked for one, but you know, give her three.

Could I help someone else? Yes.

M: What's your all-time favorite site?

Jill Ellsworth: Oh boy, you really know how to hurt a person. Well, I've got several favorites and they come and go depending on what I'm up to. I have to say that FedEx is a favorite of mine. I'm a "Type A" person and I love to track my packages. I want to know exactly where they are and that Page works like a son-of-a-gun. I love it. So, that's a favorite.

Another favorite of mine is a new favorite, so you see they come and go. It is the amazon.com books site. I recently went and bought a lot of books from them, and one of the reasons I did is they have unusual books. I bought a Herman Hesse book, *The Glass Bead Game*, that I've been hunting for — and you're thinking, "boy, there's a yawn." It's a book I was hunting for and they had it and I pressed it and got it. So, what favorite is changes according to what I'm doing.

When I'm doing a lot of research and hunting, Lycos is a favorite of mine, www.lycos.com; I love it as a search engine. But I guess FedEx has an effective page. Hewlett-Packard is certainly an effective page for getting information, for figuring out stuff. So, that's more than one.

Anything else I can help you with? Yes.

M: [inaudible]

Jill Ellsworth: No, you won't. You know the story about the cobbler's children having no shoes? My Page needs updating, and it hasn't been in a while, so I have not maintained fresh content. I've violated one of my own rules. You'll find it okay, but you won't find it great. Please, don't send me mail about that.

Anyone else?

M: How fresh is fresh?

Jill Ellsworth: How fresh is fresh? Well, that's a good question. His question is, how fresh is fresh? It seems to me that the answer is different depending on the purpose of your site. Let's take Hewlett-Packard. Fresh at Hewlett-Packard means that the parts are up-to-date, the prices are up-to-date and the information is accurate. Now, is that a week old or is it a month old? I don't think that matters; I think it's fresh in that it is completely accurate.

Where you're trying to generate a lot of foot traffic and do a lot of interesting things, then be flashy on the Net. I mean, it could be hours of fresh, you know. And if you're a news site, fresh means right now.

So it matters a lot what your business is. And in my case, I think I'm only slightly out of fresh, but I'm out of fresh, yeah.

Go ahead.

M: [inaudible]

Jill Ellsworth: I'll paraphrase the question and see if I can answer it. The question, I think, is, "How important is it for a page to have an on-line transaction form to do it right there or to have alternative ways of purchasing stuff, say through an 800 [number] or through e-mail?" Is that it?

M: No. For example, [inaudible].

Jill Ellsworth: Okay. It seems to me that the key to success with being able to sell off of a Page has to do with, and I know this sounds funny, the degree to which the sale is an impulse sale.

A site that's appealing, with small amounts of money — to impulse sales right there I think it's very important to have e-cash or some mechanism or a form, really quickly, to do that. And if it's a small amount, let's say \$20 or less, I think it doesn't matter to the consumer.

Now, when I'm beginning to spend more money, say \$500 for some really great software package, I think it matters a lot more to me how secure that is and the way in which it's done. And my hunch is, I may be wrong, but a \$500 purchase is less of a pleasure purchase or less of an impulse purchase. So, I think it has to do with the size of the purchase and the relative impulsivity of that. That's my hunch about that.

Yes.

M: [inaudible]

Jill Ellsworth: Oh, of those sites that I studied out of the U.S. — there were 42 that were outside of the U.S. and I did not screen for that. I say they own the Net. The vast majority of those were in Canada, but again that represents the fact that Canada is really on the Net, you know, and in some ways really more wired than we are.

Other questions? Yes.

M: [inaudible]

Jill Ellsworth: Not yet. I'm hoping to get it there. What I'll probably do is put a *PowerPoint* file there, and I'll try to include some of the statistics.

I think I'm out of time, but I can take one more? No? I guess we are out of time. Thanks very much. I appreciate your attendance.

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SPEAKERS

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Director of Libraries, Babson College
Walt Howe
InternetSIG Manager, Delphi Internet Services Corp.
Steve Linowes
Product Manager, Windows 95, Microsoft Corp.
William Wong
Enterprise Integration Technology (EIT)
Paul Grand
Chairman of the Board, NETCOUNT
Rob Glaser
President & CEO, Progressive Networks
Roy Ang
Qualcomm, Inc.
Russell Williams
Vice President, Individual, Inc.
Eric Hartz
Vice President, Security First Network Bank

[Two speakers were removed from this transcript at their request.]

Jane Dysart: Good morning. This is the beginning of [the] Hot New Technology track. The first session is going to focus on new technology and new products that have appeared at the show. My name is Jane Dysart, and I'm the moderator this morning. I'm the principal partner of Dysart and Jones Associates, an Information Management Consulting Company in Toronto and I also handle the program for Internet World, Canada for Mecklermedia and participate in some of their other shows.

With me up here are Hope Tillman, who is hiding back there, and Walt Howe. Hope is Director of Libraries at Boston College, and Walt is the InternetSIG Manager for Delphi Internet Services Corp. They are both net writers and in fact they met and married, not via the Internet to get married, but did meet that way. So they have gone with me through the exhibit hall and attended some press conferences because I'm sure, you have all have found over the last couple of days, it's quite mind boggling trying to sort through all of the things that are being presented at this show with the hundreds of exhibits and hundreds of products, it's really difficult to determine what's important, what's going to the be future, what we're going to look at down the road, etc.

Things are just changing and so fast and what we're trying to do this morning, or what we will try to do this morning, is to focus on some of the trends. They are not the only ways, they are the ones that we have selected to show to you this morning. Some of them include some significant new products or products that were not on the Internet landscape six months ago. We want to highlight some examples and want to apologize for any we may have overlooked, but as you can see that hall is very large and the number of companies so huge that

it's difficult to sort through. Definitely a challenge and hopefully at the end we'll have a bit of time for you to tell us some of the things that we may not have highlighted but that you think are some of the trends that the future or the hot new technologies or products that are coming along.

Certainly, there are lots of Internet providers and Internet access services out there on the floor as well as a lot of hardware and software suppliers. The program this time [inaudible] sorted in the pack by general categories, some of the exhibitions each [inaudible] if you try to focus in on ways. Our focus today has been influenced by the first keynote speaker, Eric Schmidt from Sun Microsystems, because he said content is king, so for this session what we have done is sort of loosely base our program around content.

We're going to start off looking at security and enabling commerce facilitating commerce to happen over the Net. We'll look at tracking, look at who's doing what on the Net, measuring what's happening, what's going on out there as well as how to track the delivery of content so that you ensure payment or you could focus on copyright and intellectual property.

We'll move onto filtering, obviously, something that is key with the volume of mail, products, and technology that's out there. So with our filtering — we'll start first with filtering, e-mail from various sources that [inaudible] a real challenge to keep us. We'll look at filtering content. How to focus on what's really important to you. And then we'll look at filtering for child protection.

We'll have, at that point, a short break and then we'll move to look at some of the new trends and things that are happening with browsers and views of the content. A little bit about authoring tools and the way we add content to the Net.

In some of the sessions later this afternoon the focus will be on other aspects of content — sound, video, gaming — those kinds of things, so the format and what we want to pilot today is to have some short presentations from a few of the companies that we selected. I want to thank them in advance for taking the time out of the exhibit hall. It's very busy out there and they have lots of people here but still not enough to meet the demand for information, so we really appreciate their taking the time to come today and tell us about their products.

So we'll take some short presentation, then we'll take a little bit of discussion from our panelists and/or questions from the audience. We'll try to move it along because we want to try and get through a fair amount this morning.

Without further ado, I'm going to start with our first section on commerce, certainly one of the fastest growing areas of the Net study that was released here. A Nielsen study that was commissioned by CommerceNet earlier — was that yesterday? It seems like a long time ago. Anyway, basically what it says is that the Internet users in the U.S. and Canada are wealthier and better-educated than the [inaudible] as a whole and that 13% already use the Internet to purchase products.

So to talk to us a little bit more about this this morning, we have Dr. William Wong, who is currently with Enterprise Integration Technology, which is merging, transforming and going to go with Verifone. He will be Program Manager Rep for on-line payments in that environment. His organization is already a part of AmericanNet and William, if you would like to come up here, I know he's going to assure us that full interactive commerce is just around the corner and that security issues and those key barriers are almost a thing of the past.

William Wong: Good morning. What I'd like to do is, as Jane asked me to, is talk a little bit about security and so what I'd like to do is give you context for my comments today, spend a little time talking a little bit about the requirements of what we term security and then give you maybe one or two case examples of what we've seen already with some commerce state

members who have been looking and evaluating approaches — conducting electronic commerce on the Internet. And then I'll tell you a little bit about some of the challenges that we face.

Most of them are not technological but are more business-process related and infrastructure-related, from legal and governmental restrictions of the infrastructure challenges of going forward.

So, where as a technologist might say security in its variety of forms might be a thing of the past or an issue that already been addressed, I think we have actually a lot of challenges ahead and active deployment and I'd like to open some of those.

So, to begin with, I think the context or context of security actually spans multiple levels. Certainly, everyone a lot of times is fixated over two types. One is message related to the security of passing information across the Internet and ensuring no one else except you and the recipient can view that data. But, as you are aware, there is also network security and a host of security-related issues as well as the message security. All three of those areas need to be looked at carefully when deploying a service or a solution for you and your customers or suppliers that's secure. There's no sense in protecting your credit card over the Net when it lands on your machine and a cracker could come in and examine that particular credit card number on your disk; so fixating over choosing particular message protocol for security is not going to be sufficient.

Now, the specific requirements that we've been looking at for security in general, be it host or network or message recipient, have been the following list — certainly confidentiality is the first requirement that most people think about, making sure that no one else but you and your recipient can view that data. The second very important requirement is authorization, knowing that the message was indeed from the person whom it says it is; you can never tell whether it really came from that person, so today I would advise people who receive e-mail from someone saying please transmit \$50 to me to be suspect of that unless they are verifying.

The third requirement is integrity, knowing that the message was received after it was sent. I think all proxy servers which people are now using for a variety of purposes, including performance optimization, are actually an interesting place for a tax because when people receive a message the first time they get cash on the proxy, then some other person might come in and make a modification to the message and you result get the situation where someone wheels a fake ATM machine into a shopping mall and starts collecting messages. People don't really know. That's a situation where authorization is an issue.

There's also the idea that someone might come in and replace or capture your message and replay them in a slightly different way, and that is an issue of integrity.

And then the last sort of important one is non-repudiation, the ability for you to verify that the recipient did indeed transmit that message and it's authentic. That is the fourth important part of security.

Now, certainly in the first one the confidentiality requirements we talked about — encryption, authentication, or repudiation — we talked a lot about terms like digital signatures. Integrity talks about message, and these are all technological terms for technologists to typically refer to. But I think the important thing to take from those is sort of looking at your architecture of how you deploy your services, either as a virtual mall or as a consumer looking to buy things. The issue here is not significant from point-to-point from your client to your browser to the web server, but as merchants thinking about what happens when the information is accessed at your particular machine. What happens after that [is to figure out] how you control and manage that information, protect that information so that leaks of that information do not constitute a security risk.

Let me sort of give you a couple of examples of what some of the members have been look at and evaluating. There's a very large government agency that a member of CommerceNet has been looking at, hoping to reach out to both corporations and improve their tax business processes, as well as the situations that allow them to be able to retrieve information about their earnings. So, the first issue for the agency was confidentiality, being able to ensure that people who are transmitting their sensitive personal information were able to get that over to that government without anybody else being able to look at it.

But then the next thing was that in certain situations, in certain interactions between the individual and the government agency, they wanted to make sure that the individual was indeed who they said there were, and so the issue of digital signatures became fairly important to them, and who certified those digital signatures became quite important. Without that in place, they weren't going to allow those types of services.

So, looking at specifically the way they implemented things, they looked at secure [HGP] and decided that based on those two protocols — we're talking about the Web in this particular case and how they wanted to interact with individuals — they took a look at those two protocols and decided based on their requirements one of those protocols would be applicable for each particular service. What they end up doing, and they're still in pilot phase, is actually deploying both — looking at whether they needed digital signatures, something that allowed the user to digitally sign a request, and allowing the consumer to be able to verify with the Social Security Administration or the government agency that they would maybe just use a secure [inaudible] and that would be sufficient.

That's an example of trying to separate out, based on their requirements, what technologies we use to deploy for particular services. And it wasn't just one approach; in other words, to secure a tax transfer was just one of them and it wasn't sufficient, or one wasn't the only solution for them.

Another example of a situation in CommerceNet was people looking at supply chain management and having several manufacturers and suppliers using the Internet to share requests for quotation information over the Web. And from that organization that was issuing these request, [there was the matter of] quotations being issued to specific people out there in their supply chain, and being able to authenticate those types of people. And again, showing digital signatures and certification was an important requirement for them, and so they chose one protocol versus the other.

But there are other cases in that situation where all they want to do is just get the people who have the Web browsers to download information securely without — security I mean in terms of confidentiality — without necessarily requiring them to authenticate this with a simple password. And something like Secure Sockets Layer was appropriate for that particular purpose.

I think one thing we have discovered over our pilot projects and our experiences has been this challenge of certification and the issues about technology. People have demonstrated public certification and digital credentials over and over again over the last years.

But the challenge has been in deployment and getting all the software vendors and the hardware vendors to agree on a particular set of approaches, the generating and disseminating and then the merging to certification of your credentials as we move forward.

Let me give you some of the examples of some of challenges. First of all, some people have the idea that there will be only one certificate or credential for you on the Internet. What some of us believe, and certainly I believe, is that won't be the case. Just like you have multiple credentials in your wallets or your purses issued by a variety of organizations for a variety of purposes, we see the same thing happening on the Internet. And if that's the case then the next question would be, what's the equivalent to your wallet or purse in mailing those credentials?

Right now you pull them out of your wallet and hand them to someone, and you get them reissued and you get them in the mail. What happens on the Internet? Do you go to something like a smart card? Does everyone carry a floppy disk around? And what formats do these certificates exist in, and how do you get them? From your post office — and this has been discussed by the USPS — or from your banks?

The worst case scenario that we're facing right now with everyone deploying their own public e-credentials is that we end up with 16 different wallets you'll be carrying, your virtual wallets, if you will. And not only that, but each of those wallets will be for a specific applications, so your Netscape browser will be one wallet, your Spry browser will be another wallet, your Lotus will be another wallet, and pretty soon the consumer will virtually drop their hands off the keyboard and walk away.

So one of the barriers that we are trying to wrestle with at CommerceNet is trying to bring the awareness to the suppliers of software technology, hardware technology and the operators of these credentialing services that while the encryptions have been time-tested, and different implementation of these encryption technologies and digital signature technologies embedded in applications are going to be tested out over the last couple of months, weeks, and years, the challenges for all of the credentials — keys, we like to call them, as in key management, certificate management — is the next sort of challenge for us over the next year.

The other thing that actually is more important, and I think is going to take a little longer time, is going to be the legal status of these key certificates. There's a variety of states who have started legalizing the use of digital credential or the issuance of digital certification; the states of Utah and California have digital signature acts signed by and passed into law.

No one has ever tried these, so no one exactly knows what these credentials, the legal status of these credentials and digital signatures, how they apply, The Internet has no boundaries and knows no boundaries, and so the questions becomes, "if you digitally sign a document and have a public e-certificate issued inside the state of California, does that hold in the state of Utah?" Or worse, does it hold outside the U.S.? So that's what we're facing right now.

So in terms of looking forward, to keep this short talk short, what we see in the future over the next year is certainly more software and hardware solutions coming out. You've seen firewall vendors provide message approaches for their applications, but you haven't really seen any vendors out there doing digital issuance of credentials. I think at the next Internet World you will start seeing some of these folks saying, "So you want a certificate? We can issue one for you to save time."

What we're going to have a challenge with is the key management and certificate management, and the legal questions of the state. When you do electronic commerce, usually legal infrastructure is fairly critical. Actually, when you do commerce in general the legal infrastructure is fairly critical, and probably is the slowest of all to mature; and that's where we see the activity will be in the next couple of years.

With those questions, I'll turn it back over to you.

Jane Dysart: I think we'll move into the banking scenario that we have for you and we'll keep William around to answer some questions after that segment. And now I'd like to invite Jim Phillips to come up here.

He's with Security First Network Bank, and it's interesting to me... I was with the bank for many years, and all of the format has not changed — or the format has changed, but the content has stayed the same. When I was by the booth they were giving away toasters when you open an account. I'll let you talk to Jim.

Eric Hartz: Good morning. Actually, my name is Eric Hartz. Jim is very busy demonstrating our demo so I'm going to give you this talk. I have five minutes I was told [I could] speak, and I'd like to cover five points today about the bank.

Number one, I'll give you a brief history about where we came from and what we are; two, I'll talk about the differences between Internet banking and on-line banking, because there's a lot of confusion I believe among those two; three, I'll talk about security, which is very important and very critical to our success and the success of the Internet overall; four, I'd like to talk about where we think nets are headed in banking rather than just what we're doing today; and five and finally, if you're interested in signing up for an account, I would go ahead and do that. These are pretty much the order of the questions we've been getting the last couple of days.

The brief history... You know, a date has to make history, and October 18th of this year we became the first bank on the Internet. We are a supervision-approved, regulated, bank — insured, the whole works — and on October 18 we had our first transaction. We made a donation to the American Red Cross over the Internet, and so of us that was pretty much history making.

A little more history is that our true founders are two different individuals. One is a CEO by the name of [Chip Mayham] of a company called Cardinal Bank, which is a publicly-traded bank. The other, his brother-in-law, is the CEO of SecureWare, which is a security software company that has been working with the U.S. government for the last 10 years. They've pretty much been reworking unichex systems, removing root privileges on unichex systems so that there is no access, and so what they've done is handle B-1 and B-2 Stealth bomber flight plans and things of that sort for the last 10 years with the government.

These two were talking for a quite a while, and one said "Gosh, Internet is very hot, commerce is very hot, we have both the backgrounds to bring banking to the Internet with the banking and security experience." So that gives you a background about why we came to be and where we want to go.

The difference between on-line banking and Internet banking is the following: a lot of on-line banking services require some type of purchase of software that you have on your computer at home. You buy the software, you load it onto your computer and then you can access a bank account, or a variety of bank accounts if they're partnered with that software company.

With the Internet each one is completely fluid. All you need is a Netscape browser and Internet access, and you get our server and you do all your banking right there. We have the interface for paying bills, we have the interface necessary for moving your money around. When we want to do a software update, you get it the next day. There's no new versions that are coming out over 6 months or so, so you're literally on-line.

Second, with the Internet, it's obviously the reach. If you're traveling a lot and you're all over the place, if you can access the Internet you can do your banking. A very good example or indicator of this is what people in the military have pointed out to us. [They say], "If I get stationed abroad, let's say in Italy for six months, that means I've got to prepay all my bills, I have to give power of attorney to somebody else and then I come back and often that power of attorney has been exercised against my will and my bank account is empty." They now can go to Italy and do all their banking as if they were present in the U.S. because they're accessing their bank in real-time over the Internet, so it's a very powerful tool.

The third thing is security, and that's obviously the most important. We have tried to explain this a dozen different ways — and I realize there's all kinds of experience levels in this room, so I apologize if it's too confusing for some and too simple for others — but we have three levels of security or three layers of security. Between your computer and our firewall, we

like to use the analogy that that's the armored car. You give your money to an armored car, they lock it in, they travel over the Internet to the firewall. The equivalent technologically is Secure Socket Layer on the Netscape browser.

Right now we're going to the 128-bit key version that we would be sending out, and we use the RSA-licensed public/private key encryption approach for that. I'll talk about the break [in that encryption key] in a moment and how, frankly, that would not have impacted our bank in any way.

So once you get the armored car to the bank you need security between the vault and the truck, and that's the firewall. We have a technological firewall system, and I won't dive into all the details, but again SecureWare, our sister company, has been working with technology for a long time. And because SecureWare is also our founder, we have exclusive license to both SecureWare technology and what they've been working with. So that is our security guard at the bank — they guard your money, they're armed protection and they get it to the vault.

Finally, and most importantly, is the vault itself, and that is our bank server. It is a base system that SecureWare developed; we took the exact government technology — it's called a "Secure Web Platform" — that has in essence replaced all of the root privilege approaches that the current systems have in place. We have eliminated root privilege and replaced it with 52 bracketed privileges.

Let me just talk about that very briefly. If you want to go into a system, if you find a way... Let's say we've eliminated all of the Netscape [security] and firewalls and you got directly on to the server. Since there's no way to access any root privilege, there's no way to access any within the server; a whole different set of codes and different set of approaches to do it. If you're clever and say, "Gosh, maybe I'll just try to change the time and date, they probably aren't protecting that very much, and if I get in there I'll find a way to get privilege and do other things..." But it's 50 layers of security that we've put in place, and as you get security for each — excuse me, privilege for each — each operation that you do, say if you come in to change the date and time, you'll get privilege 49 out of 50, and it doesn't allow you to do anything else, it's only for that single operation. In order to do a definite operation, for instance a bank transaction, you would need privilege number four, for instance, to get that high in the system.

The other thing as far as weaknesses go — because any system has a weak link, and we have to make sure we've covered them. We don't believe that technology is a weak link from what I understand. We believe a weak link is a diligence on the consumer side. A lot of people put their four-digit PIN code on the back of their ATM cards. A lot of people stick passwords on a computer because they don't always remember them. We've done two things on that front.

One, we don't have a name and a password log. We use your social security number and then a password on top of that. Friends or even colleagues around you don't know that social security number, so at least they can't immediately get your password and get access. Obviously if they get both they can become you. If they're sitting at your machine, they know your social number and they know your password, they, in essence, are you now. That's where the second level comes in on the server side. We use similar approaches that ATMs use that would cap movements in your account, and we also check spending activities since we have e-mail and voice connections. If we see suddenly that there's a five thousand dollar movement of money and you've been spending 100 dollars a pop on different bills, that's going to raise a red flag for us and we're going to contact you directly before we make that transaction.

The other obvious weak point is on the administration side. Someone's gotta know you to use the privilege system we developed. We are working on or already have in place [a system] where you don't have a single individual responsible, so that way there has to be whole kind of collusion in place, if you will, for that to occur.

Now, when you compare this system to the current banking system, which is the real story we're trying to get out, this is very much safer. We've seen examples with a bank with a billion dollars worth of assets having \$20-40,000 a day in losses. Now we, like a regulated bank, have a hand on our banks, so we're insured from that point of view. We also have to have C insurance, although we had zero impact at all, not 20-40 dollars a day — not even zero — so we're pretty certain about the security so far.

The fourth thing I want to talk about is where are we going with this. What does it mean in banking and commerce? We think banking is just the first step. This is, frankly, our baby steps to get started with commerce. Our vision of the future is to bring your net worth solution to the screen. I would really appreciate if I could bring a screen up and say "here's your bank account information, here's your brokerage portfolio information, here's your insurance information, here's your loan information," and have it all on one screen together. You can do transactions among the different functions. You can buy insurance on the Internet, you can do brokerage and interest, you can get information about your portfolio all in one place. We think that's very powerful.

Also, as we see bandwidth expanding we currently have customer service reps 24 hours a day, 7 days a week, 365 days a year. If you want to do your banking on Christmas day at 2 AM in the morning you can call somebody or you can e-mail somebody. When video capabilities come down the road, we would love [to use them] and we would be in place to place a little box in your upper corner of your computer that says "Hello Mr. & Mrs. so-and-so, how can I help you today?" You have an image of a person and that should bring some relationship and interaction with humans back into banking. We think there's a way to do that.

There's also a way... There's a lot of activity with ATM machines and kiosks with this software, and they're effective. However, selfishly, we're not trying to just be a bank, we're also going to be a whole other business, and for that we have regulatory approval. We have a wholly-owned software company called Five Paces Software, and we're selling and licensing this software to other banks that want to be on the Internet. So what's happening is that if someone says "Hey, I want to be on the Internet," and they would rather not partner with someone like Quicken, where their brand is always on the screen, we're taking a very open model and saying "Great, if you want to be on the Internet, we'll redo the whole Home Page for you, your brand name appears, you own the customer and if you'd like you can use our partnerships or brokerage in insurance." But if you have your own partnerships right now, let's say in insurance, and you only want our brokerage that's fine as well, and we'll integrate what you need to put in place.

So we're going to also try to accelerate the trend not just by being the first bank on the Internet in keeping our own name, but helping others get on the Internet as well. The other thing that we would like to do going forward is with e-cash and digicash, and that's creating kind of "debited" cash for you to spend on the Internet. We think it would very powerful if you have your bank on the Internet, and you're shopping at the market and today, rather than write a paper check for someone and hand it to them in the store, you can write an electronic check sitting in the store with them.

A lot of the companies out there... For example, I was talking to Open Market, and they have a lot of relationships with different merchants. We can set up a verification system with our bank just as you would with a credit card company, and they could contact it and see if you are the right person and say, "Yes, you have a balance to write this check and therefore we accept it." So you've in essence created electronic cash in that way without having to create a special system for doing debited digicash and e-cash. So that's a vision were we see things heading.

We've also tried to make it — this is my fifth point — easy to get an account. We just need to go to the obvious. You can go to the obvious; and just to show you a little bit of the flexibility, we've added for the 18th, for our grand opening, what we call "terminators," — balloons, laser words, etc. They weren't that way before. You go there and you can demo the account and how it works and then literally go and open your account.

When you click on Open Your Account, you go into secure connection and then literally just fill out a form. If you went into a bricks-and-mortar bank tomorrow and said you had to fill out an account, you would do the paperwork and that would be fine and then you'd hand it in. Here you do it securely, though for regulatory reasons you need to print it out at your home because you need a signature on file. You have all seven PIN codes here, you have all the other private information, you put a check in an envelope and your off.

We've set up a fee situation to help people get on the Internet, though some people are going to think security is [inaudible], or they're not sure about commerce, so they don't want to be party to what is valuable today.

We are actually offering no-fee checking, no minimum balance, no fees on your ATMs and 20 free electronic payments per month as well. Other services charge \$10.95 per month for that. We say up to 20.

Most people in pay eight to twelve bills a month, so that's fine. Also we send you a bunch of envelopes for your deposits, and they are already stamped. We want to make this as easy as possible because we believe when people start using this and getting the first [inaudible] of the bank that they will see how powerful the Internet is, and a lot of the other exhibitors that we see out here today will help this kind of commerce and global village really occur. That's our goal, and what we're trying to do.

Jane Dysart: I think to keep this moving along, what I'm going to do is say if you have any questions for William, you can find him at the CommerceNet booth, and if you have questions for Eric, you can see him at the Security First Network Bank booth, or just take out that map that we put in your program and go directly to those booths to find or to ask further questions or see more about these particular products and services.

We're going to move on into a section on tracking. So, in order for the content on the Internet to grow and to merge, and to attract new customers to be really appropriate to all our needs, it's really important to know who's looking at what, to take the pulse of various Web sites and to measure what's happening; so our next speaker that I'm going to invite up is Paul Grand, who is Chairman of the Board of NETCOUNT. He is very interesting, he looks pretty young, and he looks pretty scary to me, but in his bio [he says that] when he was 13 years old he helped start an educational software company, so there you go. He has also been involved in a number of projects in the film and TV industry, but what we want to hear about today is the Web site tracking services that he's involved in called NETCOUNT.

Paul Grand: Good morning. We're actually at a very interesting time right now because this is our actual first week of selling our product since we developed it about 8 months ago. We spent a great deal of time analyzing the needs of both the Web site environment as well as the advertising environment that wanted to place advertising on the Internet.

We ourselves came from a background of Web site development. We started a company last year called Digital Planet which is one of the largest providers of entertainment content on the Internet. Some of our original clients were people like MCA and MGM, and we were developing sites for them and they would say things to us like "how many people are coming to our site? We want to see if as many people are coming to our site as going to our

movies, see how it affects ticket sales.” So we started writing some basic tracking software for them.

Then a little later they started getting phone calls from people saying “We’d love to place an advertisement for you on our Web site that would also generate traffic to your Web site.” And our clients would call us and say “hey, it’s worth it.” And we’d say “What kind of traffic are the sites getting?” They would make phone calls and people who would answer would say things like “We get a million hits a week,” and of course, we all sat around and say, “Well, hits don’t mean very much.”

We are now using things like spacers that are invisible, and when hits become huge we’d look and weigh all results measuring the amount of traffic coming from your Web site to our client site and they said, “Well, we really don’t have any kind of solution for that.” You can create a special page on your Web server that will link from our server, and that way you can measure the traffic to our page.

We said “What if people start bookmarking that page with a pass, and what if that page gets listed on a ‘What’s Coolest’ somewhere? Suddenly it’s going to look like tons traffic coming from a banner that’s not generalizing it.” They said “I’m sorry, we have no other solutions.” We said, “That’s really not an acceptable answer.” We felt that for our clients we would write software that would let them monitor the performance from the billboard to your Web site and just charge back that traffic.

We started developing the software and we offered it to our original clients, who were pretty happy with it. And after a little period of time, I woke up one early morning when I couldn’t sleep and I said “If we could pass this out all over the Web we could track the Web,” and that’s exactly what we’ve set out to do. We spun off a company several months ago and became a separate corporation called NETCOUNT. Now I’m Chairman of the Board of that company, and I lead the company in terms of strategy and direction.

What we’ve done is assembled a pretty amazing team who have developed software that would allow us to do something that no one else would do right now, and that’s actually track Net users. I’ll give you a little overview of our services. One of the first things we realized was that there are lots of sites out there who have tons of traffic, like a company like Yahoo who was originally run by some Stanford students who don’t have millions to go out and spend. Well, they do now but they originally didn’t have millions to go out and solicit people to place advertisements on their sites, so they couldn’t go out and place advertisements — and I’m talking about an IP address now, about individual people who are coming back to a site.

Our software allows us to watch and see who’s coming to a site and going back over and over again. It also allows us to watch somebody going from one site to the next which allows us to really truly monitor the performance of a billboard.

Right now if you are paying for a billboard on any Web site, you might pay some 30 dollars to have an advertisement. The question is, is that advertising performing? Someone could, if they wanted to, give you numbers; they could sit there and see how many times somebody clicked on that advertisement, but the question is that one person clicking on it or was that 10,000 people clicking over and over again. It could be a program that someone wrote to click on it over and over again.

What we do is we have a service for someone who has advertising on the site, we give them a list of the actual number of times an advertisement was deployed, how many people saw that ad, how many people clicked on the ad, how many people actually made it from the ad to the site because for an advertiser who is trying to drive traffic to their site, they need to know how many times someone actually gets to their Web site, not just clicks on a banner somewhere else.

We've even seen cases where there's been blockage roads, the time when you can't get from the advertisement to the Web site, as high as 25%. That's a pretty high number. You really want to know how many people are making it to your Web site. Our software lets you do that. Then we thought it's really not enough even to [inaudible] users, which is a wonderful thing because no one has done that before. There's one elusive thing that people have been waiting for and asking about but have been unable to receive...

[Tape change]

Paul Grand: ...and that's demographics. Authentication and giving out digital IDs is where someone has a record of what you're doing, and that's something that's very scary to the Internet audience.

Right now people are all worried about someone going in and getting a subpoena for their records from video stores to see what videotapes they rented. On the Internet, it could be a lot scarier. Someone is really able to record what that you do over a period of time and, trust me, people will ask for that information if it is available. The system we designed, which is part of NETCOUNT's *Head Count*, allows users to remain completely anonymous.

The idea is that instead of going to someone who issues a digital ID who keeps databases and saying "Okay, these are the names of the people, here's their..." you can just provide your ID at the time when you come to a site. We design a system where no one will ever have to present an ID. It's done completely automatically by them by their browser.

The idea is the very first time a person is seen by us at any of the sites that are learning our NETCOUNT software, any of these sites, that person is asked the very first time by that site to fill out a form. This form is not like some of those forms you may have seen already that ask you everything from your income to your age to your occupation to the company you work for, your mother's maiden name — we don't do that because we consider that to be truly a privacy issue. That would mean we'd have to get that database information, and we feel that wouldn't be a really good thing today.

So instead what we did is asked people to provide us with basic information like the street address and their zip code. All we do is we match up the street address and the zip code for the household demographic, the information and the street address and all we're left with is a demographic and an ID. That's it, we don't get anything else in our databases so we can never actually say this is the user is who is coming on your site. Once a person has done this they are never asked to fill that form out ever again, anywhere else. They're never asked to fill in an ID code to go from site to site, there's no password box. They can be completely transparently tracked by us and we can report demographics.

So what our system actually gives you is a report on your Web site, which is very detailed, which like I said measures page transfers, even on an hourly basis, so you can see what pages is on your site are the most trafficked pages, what time they were transferred and how many people saw them and even the demographics of the people who are looking at it. And that's something that's never been available up until now. The idea is that we want to get a complete and total mass of traffic coming through our machines. We want to know what's happening on all the sites on the Web.

Once we've gotten all this information, we have a service called the NETCOUNT Rate-and-Rack Intelligence section. What the rate-and-rack intelligence does is it lists the sites that we are tracking by industry category and it actually breaks down the volume of traffic that's being reported by those sites. It's very comparable to something you'd look at in a magazine and see how different TV shows did last week, or how the different movies did in a box office.

What we do is we list just the volume information; no detail, no information about the number of users, we don't actually tell you the demographics of the users. We just give volume statistics, so you can compare all the sites. The idea is that when you're a person who's in the media research industry or a person who's trying to place an advertisement on the site, or you as a Web site are looking for somewhere to place advertisement, you don't want to have to call up ten thousand Web sites and say "what's your traffic?" You can come to one simple place on our site, they type in the search parameters they're looking for and they're able to receive the site that matches their category.

Once they've got that handful of sites, they click one more time and they can get a rate card for each of those sites. That rate card listing and that volume information is provided by us for free to those sites. So conceivably, a site can come into us and say "Hi, we're so and so and here's our URL," and we give them the software they need, they get the information transferred to us, we process it, we list them in that rate-and-racking intelligence section with their rate card and they haven't paid us a penny, yet that site is now ready for advertising like any other Web site.

It also enables you to compare how your sites are doing to competitors, which is something that a lot of people have been waiting to do. You're able to look and see how is my Web site affected by what my competition is doing. Someone comes out with a site that's generating tons of traffic, and it's really exciting — they got a brand new promotion, traffic on your site is probably going to drop, and you want to see that comparison. We can actually provide that now. The way the service works for us on a subscription basis is the people that want to get into the rate-and-rack intelligence section pay us a monthly subscription rate for a certain volume of reports. They come in, they can run standard reports which list just by industry category, or they can select custom reports which costs more in terms of record units, but provide searches across all categories, across demographics, and even across user groups.

So we're able to actually provide for the first time a service where somebody can say "How is my site doing and how does that compare to other Web sites?" What this is enabling now is several different things. Besides just measurement of your own site, people are able to do things like now just actually compare how advertisements are doing so if people place 5 different advertisements on the Web, you can see if this one is working vs. these other four, so maybe I should stop using this Web site and use another one. It also changes the way advertisements can happen on the Web.

Right now the current model is that you see people paying \$30,000 for a billboard on another Web site. The problem is that if you have a limited budget then that means you can only place a couple of ads. We designed a system where it actually authenticates the people who are being handed off from the advertisement to the Web site, and we make sure it's not the same person over and over again. The idea of this is that people can actually now start billing on a per inquiry basis, so instead of saying I'm going to give you \$10,000 or \$30,000 for an advertisement, they can say I'll pay you a couple of pennies per click, or actually per user that's coming across. And that's authenticated clicks, they're not just one person clicking over and over again.

Taking it even a step further, someone who is actually selling product on the Web site can offer a commission to a person for placing a billboard. So conceivably a person can place a hundred billboards on the Internet and they can pay all those people commission on the sales on their Web site, and not lose anything. They're actually gaining, they don't have to worry about throwing money out the window, which is basically they could be doing right now.

So it's a system that's available. You can come down to our booth and take a look. As I said, it's available for free as well, so anyone can get started and whenever you're ready just drop up to paid service. Thank you very much.

Jane Dysart: Thanks a lot. This is a real challenge for everyone; on the one hand we want to be able to get you a lot of information and whet your appetite for some more, but on the other hand we want to move through a number of sessions, so it's quite a challenge.

We are a tad behind, and we're going to move on to look at filtering that's so necessary in today's highly electronic and information age. With an estimated over 40,000 Web sites, it's really often very difficult to deal with the volume. I'm going to actually rearrange these just to make Hope's life a little difficult because one of our speakers has a plane to catch shortly, so we're going to actually start the filtering section with Rob Glaser, who is progressive and CEO of Progressive Networks, and he's going to represent PICS consortium, which is the Platform For Internet Content Selection.

Rob, if you'd like to come up here we'd like to hear how you're going to revolutionize the filtering content for child protection.

Rob Glaser: Thank you very much. I appreciate the invitation. What I'm going to do today is recapitulate in rapid speed, although I probably won't talk quite as fast as the preceding speaker, but I may come close.

An announcement that we made on Monday here will sort of give you a little context about what the announcement is all about and where its going.

What PICS stands for is the Platform for Internet Content Selection, and it is a vendor-neutral, platform-neutral, content-neutral framework for describing and characterizing for the Internet. The genesis of it was actually that several of us realized that the Internet was becoming a mass media.

My company creates software that makes audio and multimedia practical over the Internet, so we sort of saw the issue square-on and we got companies like Netscape and Microsoft — who obviously have very significant positions in Web browsing and access operating — to just say that, in the context of things that are going on in Washington D.C., the government was saying "Well, gosh the Internet is becoming a mass medium, kids have access to it, kids know more about it than their parents therefore we gotta censor it," and we thought that there was a different way.

We thought that there was a way to preserve the diversity, creativity, vibrancy and energy of the Internet, while at the same time creating technology that enabled the legitimate interest of parents and educators to frame the media environment, if you will, that their kids saw. And this was really one of these cases where you could really have the best of both worlds, but we needed to act fairly quickly because the government was marching. And also we needed to act in a industry-wide way.

So we pulled together a project that we originally called "The Information Highway [inaudible]" and with the Paramount Group announced an intent of the three companies to create a standard of specification; and a couple of months after that we pulled in about 25 companies that were working very closely with the WorldWide Web consortium out of MIT to create an industry-wide group.

We now have about 25 members that are creating technical specifications for how content filtering will work with Web browsers, newsgroups — it's a generally wide framework for getting content into your PC. What we announced Monday was the initial publication of technical specifications, and if anybody wants information on those specifications, go to the

Web site that was on the page previously. It WWW.W/ORG/PICS, all capitals. I think we're on the top-level page there.

And that is the place on the Net for you to get more technical information. What I'll describe now is basically sort of the essence of what we're doing, what the road map is for the next steps. What we've published is a way for any third party to produce what's called a "rating system" or a rating service based on one or more rating systems. The content of a rating system we'll all familiar with; you know, we're familiar with what you could think of as an extreme rating systems like the way the Motion Picture Association of America characterizes its content in a very monolithic way. The whole movie is either G, PG, PG-13, R, NC-17, etc.

So you have the concept in that case where there is one category, if you will, an overall rating and then there will be four or five descriptions within that category. But given that computers are very good at filtering in all kinds of different ways, it seems to us we wanted to have a more generalized framework. Instead of it being one category we wanted it to be three categories, 30 categories, ten categories, whatever the person characterizing the content feels is an appropriately way to characterize information.

So, for instance, to describe another rating system that is supporting PICS, the Recreational Software Advisory Council has a system that they use for video games describing content based on three criteria: based on sexual explicitness, based on violence and based on language. And for each of those categories there's a rating scale, sort of akin to G to NC-17, ranging from tame to strong or explicit and in that case it lets the parent or the educator characterize the content they want the kids under their supervision to have access to.

So that kind of approach, a generalized framework is really what's behind PICS, and the announcements of the specifications describe the framework, really a technical specification for how anybody could put together a rating service. In fact, the day after we announced on Monday the first of what we hope will be a number of third parties — there are some third parties that are in the PICS consortium but even a new one that we hadn't even known before hand had announced — a company called Internet Filtering Systems announced a scheme that goes even further and allows people on the Web themselves to vote for rating systems.

So that's exactly the kind of spirit that we're trying to get, the notion that the Net will move to a model where there are multiple rating services, where *Parenting Magazine* might have one, *Good Housekeeping Magazine* might have one, your local PTA might have one, the Christian Coalition might have one and then parents and educators would pick one that most closely is tied into their values and their sense of what was important.

People ask us how the economics for this will work, and our answer is [that it will work] the same way it does on the Net. There will be some people that do this on a voluntary basis, both providing the systems and the services that hook your computer into them, or other people will be doing it on a fee basis.

A number of the companies that are involved in PICS are companies like SurfWatch and NetNanny that are already delivering products, like PICS, that deliver their own systems for their own services for doing rating and tying in your [inaudible] browser or your access software into these rating services. All those companies — in fact all the ones that we know of — have announced that their planning to support PICS either by running their own rating services or by selling the systems to consumers and parents and teachers and the general public.

Well, just to kind of lay out the timetable from here, we announced that we have about 25 members in PICS, and our most recent additions are Digital Equipment Corporation and New View, and you get the full list of members on the site. We announced about 15 additional companies that announced themselves as supporters, and one of the things that is really exciting

about that is that they are companies like NEC and France Telecom — which has clearly given the global nature of the Internet.

For something like to take root it has to be a global system. That's one of the problems, frankly, with these domestic legislative solutions; they try to ban and censor stuff on the Net, and it won't work because you'll have all these services out in Belize and other places. So clearly, for something like this to work there needs to be global cooperation, and I think we made good strides towards that end.

The next upcoming timetable for what we're doing is to release the draft for the initial technical specifications for how you characterize a rating system. That's already up, and you can pull that off the site. We will be, by the end of the year, putting out the draft specifications for how you transmit those rating systems, and there's a whole set of approaches there. The rating system can actually be with the content, so in other words you the content provider characterize your content yourself; or it can be a third-party rating system that's delivered on the Internet, or a third-party rating system that's delivered off-line, say on a CD-ROM or in some other methodology where it's published on a regular basis, and that specification is to come.

By January we'll have the final specifications and also a sample reference code that PICS and will release in a totally unencumbered way to the industry. The next step after that is up to the industry, to have the leading software companies build this capability into Web browsers and Net access products, to have the third-party services and the third-party rating systems actually embrace and support the system. We'll be doing a lot of work in the days and weeks ahead, and we're very interested in your help and your support, and the industry's help and support, to turn this framework which is off to a very promising start into an actual end solution.

The whole legislative environment — speaking very candidly — in Washington D.C. has not gone away, and our announcements have had a very positive impact on the efforts of the folks who don't want to see a government censorship approach. But the government censorship approach in the form of the Communications Decency Act was actually passed by one of the two Houses of Congress, by the Senate, and it is still pending as a possible solution if we as an industry don't move forward aggressively and energetically; so please encourage anybody who is not currently a supporter of PICS to get information and sign-up. We have, if anybody is interested in getting access to technical information, information on the site on how to get access to technical information and to contact the technical committee.

I personally chair the committee and would be happy to share any information I can. My e-mail address is robg@prognnet.com and we have some PICS information at our booth, so if anybody is interested in this information leave your card and we'll send you on information.

Again, we want to thank the conference for giving us a chance to update you on what we're doing. We really strongly seek your support, because I think that together we can maintain the openness, diversity and creativity on the Net and do it in a way that makes it a safe and appropriate for parents and educators, and honestly not have the government get involved in a way that would be really deeply counterproductive. Thank you.

Okay, we're going to continue with filtering and bring Roy Ang from Qualcomm up to talk about filtering our e-mail, [which is] certainly one of the most popular activities on the Net and something that I think we all need to help in doing. This product that Roy is going to talk about comes from *Eudora*. Can you reach the microphone?

Roy Ang: Good morning. I'm from a company called Qualcomm. I'm hiding, so you can't see me. We specialize in a number of products, including digital cellular as well as GPS and satellite work, but the product I'm going to show you today is called *Eudora*.

What I'm going to show you is the filtering capability of *Eudora*. As of the latest figures that we got just before the show, there are some 11 million users *Eudora* now. I don't know what your days are like, but I can walk in on my job and have between 250-300 messages a day, which is pretty horrendous.

So what I've done is I've brought in an example mailbox. This mailbox has mail from all different groups, and what I've done is labeled them so I can tell which groups the mail came from, which ones have attachments, which ones were rated as high-priority by the sender, which ones are read and which ones are unread. Because I end up with so much mail it's almost impossible, if I came into an in-mailbox like this, to know what is important and what isn't; so what we offer is some pretty industrial-strength filtering, and if you come down to filters here, what I've done is I've set up a filter. I haven't searched for any incoming mail, so it will, automatically on the fly, as it hits the in-mail box.

I have it set so that subsequently I can go back and check any mail, any mailbox at any time and apply these filters as well. This pretty simple filter just searches the "to" line, but you have a choice; you can search the to/from subject, carbon copy/reply to or any heading, applying the esoteric headers for folks who don't pay attention to them anywhere in the body of the message.

I have it search for a particular string — in this case it's Jackie, but you can put other rules to it — with [a string of] contains/doesn't contain, /starts with/ends with and on and on. I can then apply a second rule here if I wish, but in that particular case all I want to do is just label. I've decided to label it "Personal," and then I have it automatically transfer into another mailbox. In this particular header I've made it a little more complicated — actually, no I haven't, let me turn this on... This one, again, automatically sorts any of my mail as it hits the in-box, and I can go back and search any other mailboxes. This one is searching in the header. Again, it's looking for Jackie, unless — and you can ignore and or unless — unless there's also an attachment enclosed, and if that's the case I'll send it straight to my marketing mailbox, automatically on the fly, without my doing anything. And [it will] also color it.

Now, if I want to apply the filter as soon as your mail hits the in-box you don't have to do anything; however, we'll take the case where I didn't apply the filters, I just created them. This in-box looks pretty scary. What I decided to do is select them all, and then, if the mailboxes have unread mail in them, what I've done is create a hierarchical structure here. I've worked [inaudible] and then I split it up into Engineer Work and Marketing, and apparently I have some messages.

If I take a look at any of these messages you'll see that they meet the criteria here. So this is an example of what I can do.

In addition, what I could do if I wanted to is add some other features to the product, where you can select a bunch of messages and change at any time the status of those messages, what you think you should apply to it after you've read the message. Right now what I'm showing you is version 2.2 for Windows. Our 32-bit version should be finished in November, and we anticipate that this should be up by the end of the year. The filtering capability in a ruling is quite more extensive. For those of us who don't have very much time, this will save your life.

If somebody comes up to you and says quickly, "We have a meeting, we need to go over all the things that we discussed in marketing last week," if you're looking at 300 messages, what are you going to do? Chances are that you probably can't hit them very quickly and you can't print them out very quickly; by being able to segregate them this way and organize it, it helps a lot.

I invite you to come by booth if you have any other questions. This will function under Macintosh or any version of Windows, and we also supply the server side of this. This is a POP 3 client. Thank you.

Jane Dysart: Thank you, Roy. Definitely stop by to see and hear more about filtering, and about your e-mail and managing it. Our last speaker on filtering is Rusty Williams, who is vice president of New Internet Ventures with Individual Inc. He's going to talk to us a little bit about filtering resources, all of those resources that are available out there on the Net and focus on content, which is particularly relevant and important to us.

Russell Williams: Hope can be a good enough wheelperson; I'll speak from the podium. I'll quickly give you an overview of Individual Incorporated.

Individual Inc. is a leading provider of news services to businesses and individuals worldwide. We focus on the business-to-business market, taking over 650 information sources — including newswires such as Reuters, AP, Kyoto, Phillips newsletters, EMP magazines — it's a long, long list of information that we take and we filter, using technology that we licensed from Cornell back in 1989, called Smart Technology.

It takes all this information on a daily basis, sifts through it and finds information that's relevant to specific subjects, to specific industries and specific topics that you could use on an individual basis to track on a daily basis so that you have only the information that you find relevant to your interests; so this is sort of a big step forward in the effort to help you with information overload in a sense that there's so much happening in this industry, and we are making it our goal to make information more personalized to your needs.

We have several products. What we'll be demonstrating today is a product called *Newspaper*, but actually our flagship product is called *First*, which we will sell to large corporations where they have needs to track competitors, to track industry trends and other information. We will go into an AT&T or an IBM or other large corporations, and we'll sit down with them and say, "What are your information needs?" And we design a customized solution for them that appears on their LAN, either by Lotus Notes or by Collabra or by Web Platform. That's actually still our flagship product in helping the business market satisfy or solve this information overload problem.

The second product we've developed is called *Heads Up*, where on an individual basis you can get by fax or e-mail the same information delivered to you on an individual basis, where you pick again from these topics that are pre-filtered and sent to your mailbox every morning.

And finally *Newspage*, which is what we're demonstrating at our booth, and what is certainly most pertinent to the topic here at Internet World. It is our WorldWide Web site that we developed about six months ago. It's a fairly new entry, using the same technology, using the same information sources and making it available on the Internet; so, there's *Newspage*.

As an example — are we up at the search screen? Let's type in "Internet World" as an option to see what types of information and what new issues have come out about Internet World over the past day. Did that work? And after we do this, we return to the main menu; you see the main menu is categorized by industry... we have Automotive, we have Banking And Finance, we have a long list of industry characterizations that we've built up information sources for to help people in those areas.

So when we return after this brief demonstration, we'll see that again we've tried to categorize by vertical market, and again we have sales teams that will go out to companies in those industries; but also this information is available to anybody on the Internet in this way, so — I can't read this very well — but there are several stories that have come out from different information sources. You can see one from *Information Week*, the next one is from Knight-Ridder Information Services, and *Communications Week*.

Again, these are all pre-filtered by this technology and an editorial review board as highest-relevance, given the highest ranking related to this topic that we've typed in. You can click on this and you're seeing a summary of the news story, which is primarily the first two paragraphs of the story itself so you get an essence of what the story is about; then if you click on the underlying hyperlinked title you will get the full story itself.

This is where... well, we've actually typed in our user name, but you need to register for this site, but in this case we've gotten the full text of what is the article; so if you're following the Internet World and you want to find out about what's been published about it, here's a very quick and easy way to do it.

Again, I apologize for moving at a rapid pace, but I know we're behind in time. Why don't we return if we can to the main menu, and I'll show you the normal way you would navigate through this and you can see the industry categorizations? That probably is the best place to start there. Scroll down to where we can see the industry options.

One thing is most relevant here — I'm reading a little bit at an angle here — but you can Consumer Electronics, Insurance, Automotive, Energy, Semiconductors; most of this is slanted toward the technology and finance, industries that are rapidly changing and have very strong "need to know" on a current basis. So that's where we built our franchise, and we're building out from that.

Let's look at interactive Media and Multimedia, which is the third button down the left. You can see that through there are several subcategorizations that will allow you to pick more specific areas and will allow you to pick on a personal basis — and Hope, you can pick whatever one you want. You'll see there's several stories, and what you can do is just bookmark these stories on your own depending on what your tastes and preferences are so that every morning you can log in, find information that's relevant to your interests, and again see the summary and quickly get that tidbit if that's all you really need, or get the full story if you want.

I would imagine people would be asking about the pricing for this. There is actually a free level and there is a \$395 level, and there is also — what you need to know is that there is also different levels of sources that we have. Obviously Phillips Petroleum, or *Phillips Newsletter* has a much higher-level source than *PR Newswire*, so we have... in some cases there are stories you have to pay for in order to get them, but the vast majority, if you're at the \$395 level, I'd say about two thirds are available at that fee.

So it's a very low-cost service, and in that case the way we've done that is that we've started to integrate advertising, so that people such as 3Com or Silicon Graphics or other companies that have a very strong interest in reaching this market or reaching these people that are actually reading about this, that are starting banners, we're supplementing our revenues with advertising and sort of driving down the subscription costs, so we're moving into a whole new model with this service.

I think that's a very rapid demonstration, but I appreciate the time and the opportunity to speak with you.

Jane Dysart: Okay, now we're going to move into generation tools and we're going to start with Microsoft. While Steven is getting organized, I'm going to let Hope set it up.

Hope Tillman: While we're setting up, let me talk about generation tools. Actually, in some cases we wanted to have representatives from several products that were not able to send reps to you, so you're going to have to go back down to the booth. For instance, some of the hot products that we saw on the exhibit were *Netscape*, and I'm assuming most of you who have sat in on one of their sessions probably would want to do so with the *Navigator 2.0*, which also has the hot job of being the very hot booth. For some Microsoft Systems is another one.

Microsoft was very kind to send someone and we really appreciate that, because we know how hot the floor is; so many people are on the exhibit floor that we really appreciate those vendors who have taken the time to come up here to speak.

Steve Linowes: I'm Product Manager with the Windows 95 group. What I want to do today is first thank you for coming, but also to let you know about all the Microsoft products that we have. We'll be specifically focusing on something called the *Internet Explorer Version 2.0*.

First of all, people who have come to this show probably have noticed a big change in Microsoft. If you were here last year you'll notice our booth probably went from about 3 or 4 stations to about 20 or 30 stations, and that's just an example of Microsoft's commitment to the Internet community. We're really embracing the Internet, making it very easy for people to deliver content and also view and offer that content out on the Internet. So that's really a high-level overview of where we're headed.

Some of the products that we're displaying in our booth right now are... one product is code named *Gibraltar*, which is an NT server-based Web product. As a matter of fact, the Microsoft-based Web page today is being delivered on that particular server, so it's in data right now.

We also have a couple of great authoring tools. One is *Word Internet Assistant*, which is an add-on for the *Word* product. After all, most of the tools that you see on the floor require assume that you don't already have the content. With *Word Internet Assistant*, in order to create a Web page all you have to do is do a file save on your regular word document and it automatically becomes a HTML document.

We have a product that's called, *BlackBird*, which allows you to do real-time authoring of information, dynamic information, and I encourage you to go take a look at that. That happens to be one of the most trafficked sites in our booth, people are very interested in that.

We also have a couple of other things. One is the Microsoft Network, and the Microsoft Network actually has full Internet access and will be an environment where you'll be able to see great content from the Internet. We also have a technology that allows you to do secure transactions out on the Internet. It's called Secure Transaction Technology, and that can be viewed in our booth.

That's kind of an overview of the products. I'm obviously not going to have time to show all of them, just one of them, which is the *Internet Explorer*.

Now, the *Internet Explorer*, when we were designing it, we really wanted to make sure that it was easy to set up. That was one thing that people were telling us was the really difficult thing to do. How many people have had problems setting up, getting access to the Internet? Not that many people. Okay.

Well, it's a really easy thing to get access to the Internet. I'm not going to show you that. We also wanted to make sure that it was easy to use and easy to learn. We also wanted support for all of the industry standard at the Internet conventions that you have, like for instance, "Tables" is the factor standard. At the same time, we also wanted to make sure that we were delivering performance and innovation, and we're going to show you each of these things right now. Let me just go here to the Internet.

After you set up the *Internet Explorer*, a little icon is placed out on your desktop, and I double click on that icon and you'll notice that it comes up to the MSN, obviously. This is MSN's presence on the Internet, and it comes up. There's a couple of things you should note here. We said that we wanted to make it very easy for people to use. A lot of people have never been to the Internet before.

Well, we have a tutorial on-line, a tutorial that you can get access to that teaches you about the Internet. We also have something here in the center which allows you to explore

from a single pane, and basically you're able, from this page, to search all of your search engines like your *Yahoo* and *InfoSeek* services, as well as 800 numbers, stock quotes, etc., etc., all from within this one window.

And there are a few other things that we've done to make it easy to use. Take a look at our toolbar up here; you'll notice that if I hover any one of these icons, we have something called "tool tips." These are the same things that you see in Microsoft applications today. You notice on the right-hand side we have Cut, Copy and Paste. Again, this is the same thing that you're seeing today in the rest of our applications.

Let me show you other things that we have. We have something called "favorites" in the Internet explorer. Favorites, if you're familiar with *Netscape*, are bookmarks. It's similar to that, where I can have all of my different favorite places that I go visit available to me at the click of a mouse. However, we do it in a way that's more "Windows 95centric." What I mean by that is that you can see that I can actually create a hierarchy of all of my different sites that I like to go to, so I can have all my educational sites in a particular folder, and my sports sites.

Let me just show you how easy it is to actually create one of these. I go to Open Favorites, and it will open up a favorites folder, this is — physically it's not a text file that your saving these bookmarks in, it's an actual file that sits out on your hard disk, and we have something called "shortcuts," and these icons here are shortcuts. If people aren't familiar with shortcuts in Windows 95 the notion of shortcuts is that you have pointers to particular files, pointers can also go to folders or whether local on your hard disk or out on the Network.

With the *Internet Explorer* what we've done is expand so that you can actually have pointers to different locations throughout the Web, so these are nothing more than shortcuts to different locations throughout the Web, and I can actually create a new folder here — and this is Steve's Favorites, and there it is.

So when I go back to the Favorites, you can see Steve's Favorites right there. Well what is the big deal about doing this? Let me just show you. What I can do here is — let's say I wanted to send this to a friend of mine, send a pointer to a location to a friend of mine. All I need to do is — and this is Microsoft exchange, since these are objects — all I need to do is click on this shortcut and paste it into the mail message. Then I just send it.

How many times have you wanted to just tell somebody to go look at something, and then you have to remember what the URL number is? A very difficult thing to do. I don't remember what the URL number is. Another great thing is that when this person receives it they just need to double click, and I'll show you that in a second.

A couple of other things that you should note about the *Internet Explorer*; what you can do here with the *Explorer* is... I can actually show you within the *Internet Explorer* how you can use the object technology. Let's say I had this graphic, and I wanted to grab that graphic. I just need to click on it and drag it onto my desktop. And you'll notice this, that what it does is it sticks a GIF out on my desktop. My GIF viewer is also the *Internet Explorer* in this case, and I double click on it and you can see up pops the GIF viewer and the GIF itself.

So you can see the object technology that we have built into *Internet Explorer*. Let me also show you how we're doing some innovation. I told you how we're supporting the industry standards, but we're also building on those industry standards to do some great things for content providers. Let me just double click on this shortcut... you'll notice a couple of things.

This is the Volcano Coffee Company, and the Volcano Coffee Company is a fictitious company, but what we've done here is we've put together our technology so that you can understand how it will work.

First of all, you notice how when I first came to the page we had background sounds, and you can preset these to run intermittently, one time, as much as you want. You also need to notice here in the center how we have something called an "in-line AVI," so we have digital

video support in-line in our browser. Also notice how we have something called “marquees” or scrolling text that comes across the screen, and you can again set these to any types of configuration that works with your particular content.

Besides these things, support for these in our Web browser, we also have support for Internet newsgroups, for [Cookies], and for VRML — if you’re familiar with the virtual reality markup language— for real audio, STT, Aware, and so this gives you a really quick overview of what the *Internet Explorer* and what it really means to content providers and what it can mean to users as they’re browsing the Internet.

You’re probably wondering how you can get a hold of it. A few ways. With Windows 95, [since] *Internet Explorer* ships on PCs that have been pre-installed with Windows 95, and this is a Windows 95-based product. You’ll see it on LAN-based machines, that are pre-installed with Windows 95, you’ll see it out on *Microsoft Plus for Windows 95*, which is an add-on package. You can go to our Web site, which is www.microsoft.com/windows, which will get you to the Windows portion of our Web site, and we have it available downloadable there as well.

We’re currently in beta for *Internet Explorer 2.0* and expect that to be released fully here within the next few weeks. My suggestion for you is that you may want to come by our booth and get a more in-depth demo of some of the features that I showed you here, and some of the other great Microsoft products.

So that’s basically it.

Jane Dysart: That’s the last of the speakers that we have from different companies here today. We invited some others to be here, but as we said earlier some of them are just too busy on the floor to pry anybody loose to come up here.

For example, in this section where we’ve been talking about some of the next generation tools that are out currently appearing, we’d hoped that we could get Netscape to come up and talk to you about the new things they’re doing; we’d hope to get the Sun to get up and talk about Java, which can be used with Netscape to give new capabilities that work on both your client systems and let you do more and better things.

And I thought I’d call attention and take a minute here to talk about the different forces that are at work here. On the one hand there’s a strong need for standardization. In order for all these vast different computers and different networks to talk to each other and share capabilities there has to be standards; and the Internet has long had its process of setting standards, which is a fairly slow deliberative process which seeks consensus and tries to get everybody to agree.

On the other hand we have some very strong forces at the work in the world today that don’t like slow deliberative processes; we’ve got lots of companies that are trying to get out there with the newest and best things, and make a difference and show differentiation between what they can show you and what the — which is kind of a contradiction with the process of everybody working the same way.

So we’ve got the market pressures pushing new things on us, and we’ve got the need for standardization perhaps trying to hold it back a bit, and the industry is trying to settle these things out. There’s an awful lot to be worked out in these areas.

Another trend we haven’t touched on very much here, though perhaps we’ve seen an aspect or two of it, is that we’ve talked about presenting content, and I see that as another thing which is very undeveloped at this point for the Internet. As it’s unfolding there’s the need for better communication between people.

The old Internet that we’ve experienced had very effective ways for communities of people to get together to talk, whether it’s newsgroups, whether it’s e-mail, whether it’s such things as chat on the line. Some of the those things aren’t scaling up very well. We’re going to

have to see, before we're through, some new forms of ways for communities to form and people to work together. That's a trend we're going to see, not in this Internet World, but I think we'll see both things develop in future Internet Worlds. It'll be interesting.

Another difference that we see in things is that everybody wants something new and unique, and yet people want to be able to do things as easily as possible, too. One of the things that we looked at and we saw very present on the floor is that there are a number of different Web-authoring tools out there; we didn't try and single out individual ones but we looked at a number of booths on the floor — and I will call your attention to them if your interested in how you can go about creating new and interesting Web sites, following standards and doing it with the least effort yourself. If you aren't somebody who has their own programming staff to create things to work with, we saw a Web-authoring booth, in addition to the ones you've heard here today, but we looked at all of those and they all had something interesting to look at.

If you're looking for your own capabilities and settling your own tools your going to use, they're all worth looking at. Is there anything anybody here would like to share, things you think we should have pointed out this morning and we didn't bring out to you, that you think it's important to say? Everybody's pooped.

And on that note, I'll let you go to lunch, and thank you.

HOT NEW TECHNOLOGIES VOICE OVER THE INTERNET: WHO DOES IT BEST? A SHOOT-OUT



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SPEAKERS

Elon Ganor
VocalTec
Glen Hutton
Vice President, Sales & Marketing, *Web Phone*
Jeff Pulver
Publisher, *NetWatch*

Jeremy Carl: If you want to join the voice on the *Net Digest* or just the mailing list, what you do is you send e-mail to majordomo@pulver.com, leave the subject blank, then in the body you'd write: subscribe (space) von or von-digest, depending upon the frequency of the mail that you want to get. The mailing list itself tracks various vendors, not just VocalTec with CU-SeeMe and *Web Phone*. We actually have a representative sampling of the entire industry, not just two-way communication on the Net, but as well as broadcast audio on the Net as well. And you'll find on the list people who are users of the products, as well as the various developers and manufacturers.

Another very good resource on the Net for those of you who are sort of looking for information outside of what you might see or hear about today is Kevin Savetz, who is a sometime-writer for many of our publications. He maintains a voice on the Net Web page which is quite good. It's at www.northcoast.com/savetz/voice-faq.html. Let me do that again, it's www.northcoast.com/savetz/voice-faq.html.

This is the sort of thing that didn't even really exist, these sorts of products for all practical purposes, when we were at previous Internet Worlds. This is a very new technology. It's one that has excited a great number of people, and it's one that is very much in development; in fact many of the people who we were hoping would be with us still have their products in development.

But in any case, what I think we're going to do at this point is turn it over to, I think we'll start with Elon Ganor, who is the CEO of VocalTec, and he can tell you a little bit about his product. Then I'm going to have Glen come up, tell you a little bit about *Web Phone*, and we'll be taking questions from there. So without any further ado, Elon.

Elon Ganor: Hi everybody. I'm kind of surprised and happy to see so many people coming to see this subject. As about a year ago, I was cruising around the Silicon Valley and some other places, showing our technology, and as a matter of fact, we had been showing some of the vocal products. About two years ago we were doing basically the same thing, yet not on the Internet and some other systems; people didn't believe us at the time that this can happen. So for me, it's a very emotional moment, I must say, to see you all here.

The other emotional moment I had Monday morning when I saw the report on the *New York Times Business Section*, with the first serious analysis of what's really going on the Net. And there was a diagram there breaking up the different type of usage on the Net. The very lower one — which is still the lower one, but one day is not going to be so low on the chart —

was real-time video and real-time audio on the Net; and the number they quoted there was 1.3 million users out there. And I was kind of asking myself who those 1.3 million are, and what are the products that they're actually using.

And I couldn't help it to come to a conclusion that this one real-time video product out there that has been distributed for free for a long time, and has been quite known, and it's the CU-SeeMe product. Based on their numbers, their own company numbers, they are saying that there are 300,000 out there using CU-SeeMe. I'm not sure if those numbers are real or not, but that's the company quote. And then there was one more one million users out there using, I guess, the audio part, and I don't need to tell you which company is actually shipping a product out there since February. So that makes us happy, too.

I didn't really prepare any specific speech here because I was invited to be part of a shoot-out, and I'm sorry, but you kind of threw me here expecting me to give a speech — I was thinking I was going to give questions and answers, but I can tell you a little bit about VocalTec and a little bit about the *Internet Phone*, just offhand. You'll forgive me if I don't do it very well.

Anyway, the company is a young company. We've been five years in the market, since the end of '89. Our head office research and development center is in Israel, and Israel is a good place for technology. We have good engineers. We've been in the voice area, as our name implies, since day one, with VocalTec stemming from "vocal technologies." The company brought — and we made lots of mistakes, by the way, plenty of failures, I have to admit that — we brought five products to the marketplace. Each single one of them was first of its kind in the marketplace, so we do have the creative theme, and the leading edge-type engineers that can bring new, innovative products to the marketplace.

Yet I'm saying mistakes and failures because those products didn't hit it, and didn't make it big because they were either ahead of their time or not exactly what the customer really needed, and we've been listening for the last five years, very carefully all the time, trying to understand what the customer really wants and what the customer really needs. And the big opportunity came with *Internet Phone*.

Now, to list those products when talking about the CAT... That was Compact Audio Technology, a hardware product with our own chip design, our own [inaudible] in it, and that product was a [inaudible] product for portable computers. The beginning of '90, audio just became an issue in '91, and portable computers didn't have sound and soundcards, so we thought that would be a good idea. Everybody at the time was talking about audio annotation in documents, including Lotus corporation, WordPerfect, and others. That concept in general, didn't take off, and we didn't take off with it at the time. So that was kind of a failure — yet the product is a good product.

Then we brought Vocal [inaudible] as an application, as a software product. It is a voice communication product for your local area network, and it enables people to talk from one PC to another with the voicemail messages; [you can also] use it as a PA system so you can give up on those expensive PA systems installations and use your actual network to do that. And with that product, people would ask, "Why do I need to use my computer for voice communications as long as I have my phone?" And we had some good answers, but I guess they were too long; and in the market we're in, you have to give a 15 second speech, which we can easily do now for *Internet Phone*.

The next one was taking vocal [inaudible] into vocal [inaudible]. For awhile there it worked, and there was already a little more sexy, a little more interesting because a company with a dedicated switch a 56, 64, or T-1 between a London office and a New York office can use their PCs and their [inaudible] to communicate.

The immediate competitor to that would be a multiplexer that typically would cost around \$20,000 for that piece of hardware. And the major disadvantage, more than the money

issue, is the fact that it takes a fixed bandwidth. So if they have a 64K, 32 will be devoted for speech or voice, and the 32 others for data. That's not great, that's not very smart because you don't speak all the time with your London office. You do it when you want to do it. So you can use it for data more.

The vocal [inaudible] concept was a much better one, and I guess the time will still come that we'll see all those companies using the vocal [inaudible] concept, both for the [inaudible] and for the [inaudible], and actually this is still very interesting. So the time will come for those products as well.

It was a natural extension and a natural evolution to bring *Internet Phone* in then, so what you're seeing here is a company that is totally devoted to voice-processing on PCs and understanding the needs. We are market-driven on one hand, and we're trying to do the best to listen to our customers, and the Internet provides us an absolutely excellent place to be in order to be able to communicate with our consumers and our customers easily and quickly.

Internet Phone came to the market February 10th, and when we brought it to the marketplace a week later I knew life is never going to look the same for anyone at VocalTec. So I kind of started jogging to start with, because I said to myself "If I have to run the same kind of lifestyle that I have before, I'm going to get a heart attack soon." So I lost weight, and I'm jogging every day now and it's wonderful, and we have a very busy life and it really looks good.

One million users out there in eight months is not a simple task. We are being very aggressive in where we take this. The idea is really to make that a de facto standard as quick as possible, and the reason is very simple — unlike typical software products, which are divided... If you look at the normal distribution between competitors, you see a 60-50% split typically for different types of products, with 50-60% taken by one leading company, another 20-30% by number two, and 10% divided by 20, 30, or even more other competitors.

With an *Internet Phone* type product it's more difficult because it takes two for a tango. It's a bootstrap issue. If you have 70% of the market, or 60% of the market using one product, then the others are locked out from the real world. They just won't be able to talk to others. So if you have a cousin in Australia and he bought a new machine that provides him with a *Internet Phone*-type product, that will not be compatible with what everybody in the U.S. is using, you'll be just locked out.

And that's why we needed — we understood the market and the business, since we had the Vocal [inaudible] product two and a half years back, and we realized we had to take a very aggressive approach there. And that's exactly what we've been doing — we have a very strong OEM policy, and retail. We are in the retail through Ventana Communications, which was a very good deal, I think, for both VocalTec and Ventana because the numbers are exceeding the expectations. And we are basically in all major stores, so that's the retailer channel on the OEM side.

We have announced, up to now, about 20-something deals with major modem manufacturers, about 50% of the modem manufacturers. When you will go out there and buy a modem over the next few months, in 50% of the chances right now — and it will probably be higher numbers later on — you'll get an *Internet Phone* bundled with the modem you buy, because these guys realize that the modem is no longer just a data product, it's a voice product, too. And they are using and leveraging the fact that they can do something new because a modem is a modem is a modem, and they want to have nice, new things to be able to push their product.

Same applies with PC vendors. I'm not at liberty to discuss the names that we've signed deals with, but they are three among the major players out there that will ship their product sometime in the future with *Internet Phone* pre-loaded on their hard disk.

We had an announcement on Monday with America Online, the GNN service: Anybody from you guys that isn't GNN will get *Internet Phone* for free from GNN. PSI had announced on Monday evening the same thing. PSI will provide all the new customers coming in, or all the existing customers that request it, will get an *Internet Phone* for free. And that means that by mid next year we'll have more than seven and a half million users out there.

And I think the product speaks for itself, and since we cannot demonstrate it over here... I'm not trying to rob anybody, the idea is just that we have a booth down there and you are all welcome to come and just see it, play with it, and judge for yourself. And by the way, one last word, and that is the product is available as a free demo. You can download the product on the Net at vocaltec.com, and that's VocalTec without an "h," just vocaltec, www.vocaltec.com, and you can go and download a demo version that will enable you to communicate for 60 seconds or whatever your speaking time. On the average it's about two minutes, because if you speak to someone that probably takes some time, too. So it's a two-minute communication capability, and you can judge for yourself because it has to be put eventually to the test of the consumer. You need to decide whether the quality is good enough or not, and if you think that it's not good, don't pay us a penny. If you think it's good — then \$69, that's the risk you're taking. You can run as many sessions as you like with the demo of this thing. Thank you.

Jeremy Carl: The next speaker we're going to have is Glen Hutton, and he's the Vice President Of Marketing for the *Web Phone* product, which is done by the Internet Telephone Company out of Miami, Florida. I sort of admire them because they have come here with an alpha. Unfortunately, they thought they were going to be putting it up to test with everyone else's finished product, so they are hoping to have a final product out in the stores — when, about the end of the month? Close to the end of this month.

Actually, one thing I thought was humorous... I was talking with Rob Glaser, who is the CEO of Progressive Networks, another company, and they do real audio — not quite *Internet Telephone* — and he thought that perhaps they should be called, "The Miami Sound Machine." But we'll leave that to Glen to discuss, and he can tell you a little bit more about the *Web Phone*.

Glen Hutton: Thank you very much. First of all I'd like to say thanks for inviting us up here. We, unfortunately, are not able to demonstrate the product. I am as equally disappointed as VocalTec is, and I'm not rubbing it in, guys, I know you're still working on it. But it really would provide an excellent opportunity for those of you who are interested in voice/audio over the Internet to see the difference between the two products. There are some very distinct differences between our product and that of the VocalTec product.

To give you a background on our company, we're relatively young start-up. Myself, I've had two previous start-ups, so this will kind of be my third. I come from a telecommunications background and an audio background. I have a lot of experience in marketing, as well. We have chosen a slightly different path to present the product. You can download the product off our Home Page, which is www.itelco.com, and you'll be able to download our multimedia help system which is currently available. It's a very interesting help system. It's probably unlike of that which you've ever seen before.

The phone itself also is a very unique application that was up a little while ago; it's not there right now. Hopefully we'll be able to bring that back up again. The phone allows you to have the ability of four concurrent conversations. It's probably very much akin to the feature phone that you have on your desk at the office. You can take one call, place another call on hold, and within a 486 environment, you have the ability to do call-conferencing.

The alpha itself is a very stable product. We've had numerous hours of conversation, contiguous hours of conversation. The beta will be released this November 6th, I'm not sure what day that is. Friday, I believe it is, of next week. And you will have the opportunity to download the product and demo the software, very similar to what VocalTec offers you as far as a demonstration product.

There are a lot of other applications built into the phone in that it works over any TCP/IP network, so you're not necessarily tied into the product with the network. Additionally, you are not required to sit on an IRC channel waiting for somebody to ring you up. If you are looking to use a phone product for communication purposed, i.e. a business environment, you will not have to be forced to sit on an IRC channel accepting calls that are of non-interest to you. That's one of the concepts behind the product. You will also have the availability there to have yourself posted, so that if you do wish to communicate with other people and have chat, and just sort of shoot the breeze with somebody on the Net, you will also have the opportunity to do that, as well.

One of the other benefits of the product is that it doesn't require... There are some other products that are coming out on the market, two other companies which are not here today.

Jeremy Carl: One thing I should have probably made clear before is that there are a couple other products that are sort of out there. We did invite every single player with a product on the market, and some, including Mr. Hutton's company, that were not on the market; however, DigiPhone and NetPhone were rather evasive about sending someone here. It turned out the reason why — and this is actually going to be announced here for the first time today — is that DigiPhone is purchasing NetPhone. And I think this explains, perhaps, some of their reluctance to commit to sending separate representatives to the show. So I guess we'll see that evolving and perhaps some of our panelists will feel free to give their own opinions on these products. I'm sure they have them and you can feel free to query them about any of the audio on the Net products.

Glen Hutton: So anyway, as I was stating, basically with some of the other products that are out on the Internet, you need to know the IP address of the individual that you're trying to reach. I would assume, and I'm guessing, that was one of the initial reasons why VocalTec decided to go the way they did, and perhaps hopefully when we have a Q&A later VocalTec will be able to either: a) defend themselves, or b) clarify the statement that I made. I'm not trying to put any words in your mouth, so later on we'll have an opportunity to discuss that.

So the bottom line is that you don't have to sit on an IRC channel, and through a patent-pending mechanism that we have you will literally be able to use a person's e-mail address, and by punching in their e-mail address we'll make a connection for you. And for example, if you were on NETCOM you may have a dial-up IP, which changes dynamically depending on where you are. You may be in California one day, you may be in Florida the next day, it doesn't matter. Transparently, we are able to locate that individual if they're on the Net. So it makes it a very viable product in that you're not locked into sitting somewhere.

Additionally, the product also has voicemail built into it. And you can receive voicemail whether you are on-line, or off-line, and that is certainly a tremendous boom as far as voice on the Internet goes. This product was really very well thought out, and if I do say so myself, very well designed. The interface is just an incredibly beautiful interface. I've never really seen anything like it before. The various magazines, Byte magazine, which has an article coming out on our product in February, *Window Sources*, I mean the guys that have been doing the reviews have literally called me back and said, "You know I have never seen a product that looks like

this, nor have I seen a help system as interesting as this, and it really is a very interesting product.”

So anyway, without further boring you with the technical details, I guess, should we go to another session, or...

Jeremy Carl: Okay, all right.

Our final speaker before we get to a Q&A is Jeff Pulver, and he is the publisher of *Netwatch*, and he also runs the *Voice on the Net* digest. He can give you the relevant addresses for that. He's going to talk sort of generally about the evolution and the current state of audio and telephony on the Net, and then we'll get to questions for all of our panelists. I hope that doesn't intimidate you too much there, but Jeff, take it away.

Jeff Pulver: Thank you. And I do comment that I was not prepared to give a presentation; some of this will stream, but not necessarily coherently, and I apologize.

Just a little background. Can I see from the audience how many people in the audience today have tried a “voice on the net” product? Okay. How many of you have heard of using the Internet to actually talk to people? Okay. So it looks like there's a lot of people here who are aware of what's there, and some people have actually tried the technology.

I think, as we chart history, 1995 will be the year. One of the things that 1995 will be known as, besides O.J. and everything else, is really the year that streaming audio hit the Net in a big way. And as time has gone on, we've seen with the introduction of *Internet Phone*, and being able to communicate two-way really effectively on the Net; and the whole start-up of a culture which has been growing from there, to the broadcast industry, with the introduction of real audio, and being able to do on-demand broadcasting, and so on. It's really changed the way we look to the Net as far as functionality to us, and how the Net affects us as individuals.

Talking a little about from the personal side... my background, besides being involved in technology and finance and working on Wall Street, is I happen to be an amateur radio operator for 21 years. And I, you may not know this, but I like to talk, and I like to communicate, and I have this thing for like reaching out and talking to people around the world. I was the kind of person that used to stay up until two or three o'clock in the morning and try to get that rare station in Africa, or somebody in Southeast Asia, to say that I spoke to everybody. And for me, it was personally challenging. I could never justify why I did it, but I was doing that kind of stuff.

And when I first got *Internet Phone*, and one of the things you notice immediately with amateur radio, this [inaudible] propagation, you have to care about sunspots, you have to care about ionosphere conditions and all these wonderful technical things, but the fact is that people, whomever you spoke to, would fade in and out. If they ran a lot of power maybe you heard them clearly. With *Internet Phone*, you talk to somebody in the Philippines and it's as if I'm talking to you right now — it's clear as a bell. There are times when the conditions aren't so good, but you bear with it; and especially with my background, it's amazing.

And with the Internet, I've learned there is an analogy with ham radio. The state of the routers in the Net happens to be like my sunspots; and when [inaudible] goes down, I can hear it because I see all these people drop out, and it's really become a whole culture of a way for people to get involved and to communicate.

As far as what CU-SeeMe represented to me, I was on the CU-SeeMe list. I don't know if you people are familiar with CU-SeeMe? Beginning in February for the first two weeks, there was so much noise about CU-SeeMe I couldn't figure out what was. So right before the project was announced, I announced, on the CU-SeeMe list, “if you want to talk about CU-SeeMe, come here.” And what I had done is set up an CU-SeeMe mailing list as a way to divert traffic. I

had no idea that it really would affect what I did for the next nine months, as far as being involved with the technologies. But over time, the first few weeks of CU-SeeMe being introduced to the Net was kind of an interesting experience for everybody.

Could you imagine people talking to each other, and actually talking to strangers for no reason? What happens is, the way CU-SeeMe starts off is, unless you intentionally set up a conversation with somebody, what you have is you have a whole group of people there waiting to talk to perfect strangers — and it's kind of weird. Can you imagine being marketed to? It's like people don't like being called at their houses to be told about a new product, but I found a whole genre of people who are very excited to be called by somebody in New York. And over time that's really grown, and it was just a new experience for a lot of people.

And what happened early on with my involvement with the technology — some people associate me with VocalTec because I set up the CU-SeeMe mailing list — but the fact is because of what happened in February of this year was as CU-SeeMe was starting to get rolled out and starting to get popular, the EFNet got together. EFNet is a loose affiliation of — are people here familiar with IRC? Some people? So EFNet is a loose affiliation of corporate and non-corporate entities that really manage and host IRC servers.

And the first week of March of this year they decided to ban CU-SeeMe for no particular reason, and if I didn't have the mailing list as a way to communicate with users I would have never known myself what was going on. But as an individual who tried to make a difference — I happened to have a 56K line in to my house at the time — I decided to set up an IRC server and say: Hey, does this work? And it did. And as a way to combat what was happening with EFNet I set up a private IRC server and — I'll be brief, but what we did by setting up the IRC server is we were able to isolate the traffic for CU-SeeMe away from the public IRCs and into a whole private one, and really help to evolve a culture.

From that, within a week I announced that I convinced VocalTec to set up a server, and I'm happy to say today that there are now 16 private IRC servers running around the world, which run from Tokyo to Moscow to Great Neck, New York — all providing a facility to find people.

I then started getting involved on the culture side, because can you imagine, when you start talking to people you never knew before, all of a sudden you have friends. So I set up a user directory, which if you go to www.pulver.com/iphone, you'll find that there's a whole directory. Right now there are over 2,000 people listed. Yes?

M: [inaudible]

Jeff Pulver: www.pulver.com/iphone, and what's happening is that there are whole cultures of people that come by. If you fill out the guest book you get listed by occupation, by interests, by location; and if you're an attorney, or you're an accountant, or you're in aviation — you'd be amazed to see how many people there are from your profession. And then we have links to people's Home Pages, and this is not sponsored by anybody but myself. And I did it really as a way to provide a way to find out who's out there, so that the extent of your conversations with perfect strangers would give you a little depth and background. This way you can find out a little bit about Jeff Pulver, who he is, what he likes, so that when you're talking to someone on CU-SeeMe, you could actually scan the directory and get a feel, so that the conversation is more than, "Hi, I'm in New York. You sound pretty good. How's the weather?" And what's happening is that people have been commenting back that this is really helping to evolve the whole technologies.

The [inaudible] has seen not only CU-SeeMe, but certainly we've seen and heard about DigiPhone, and I prefer not to comment about that; and now we've seen announcements with

Web Phone . And what you'll find is that over time, one of the challenges to the industry is to find a standard. Because if you and I had cellular phones, and each of us had different models, it would be ridiculous, even though we had different manufacturers, that we can't all talk to each other. But what's happening as cyberspace and various technologies are evolving, is everyone needs to stand back and figure out who the standard is going to be, and then allow for it to be adopted by everybody; otherwise we're going to see before our own eyes and hear with our own ears is a cyberspace version of Tower of Babel. Because as people innovate on [inaudible], and people provide great technologies, as someone who's watching the industry go by you like to see everyone benefit from innovation but also still be able to communicate with each other.

Anyway, I don't want to ramble on. I do publish a magazine called *Netwatch*, It's www.pulver.com/netwatch. Every couple of weeks we take a look at organizations that are involved with enabling technologies on the Net; we track video, audio marketing and services. If you have a Web site that's interesting, and that you think should be covered, please send e-mail to me. It's jeff@pulver.com, and I'll be happy to take a look and let you know our feelings. And the *Voice on the Net* mailing list is a place where people from the industry have been to rant and rave sometimes; put out information about new content, new technologies; it's really a place just to, if you have questions — come by. It's a bunch of friendly, informative people, and it's really been a reflection of my experience on the Net today. Anyway, thank you.

Jeremy Carl: Our speech-shortening technologies are still working very well. We at least can threaten speakers if you still maybe can't get the network working. I'm now going to open it up to for questions, and I'll just take the gentleman here in front first.

M: [inaudible]

Jeremy Carl: Right. Actually, I'll let Glen start with that. Once again, in fairness to repeat, I should have probably said this for the DigiPhone/NetPhone. NetPhone is really the commercial product I'm aware of on the Mac side, although there is *PGP Phone*, which is done by the same people who do *Pretty Good Privacy*. That's sort of a beta that's not commercially supported at this point. So we did invite Mac people there, and just unfortunately, the one group was just sold, so... Glen?

Glen Hutton: Would it be good, maybe, if we stood up together so that we could address everyone as opposed to having to get up and down? Just because I assume you have a response, as well.

To answer your question...we are working on a Mac product currently, and I should have described that to you. The current platforms that the product is supported under are Windows 3.X, Windows NT, Windows 95, and OS/2. As far as the networks that we've tested it on, as I've stated, anything that runs on a TCP/IP network; we've tested it using it on the Microsoft stack, for the Microsoft Network, Trumpet Winsoft, Chameleon, all the various stacks that are out there for those of you who understand what I'm referring to. And hopefully that answers your question.

Elon Ganor: In our case, we have committed to release a Mac product by the end of the year. It'll be a cross-platform to the Windows product. We do support all the platforms that were mentioned except that we OS/2, and we are not about to bring an OS/2 product any time soon to the marketplace.

M: [inaudible]

Elon Ganor: No. All the other platforms, yes.

Jeremy Carl: Further questions? Right over there.

M: The issue will be being able to combine the audio with the next layer, which is obviously going to be some image or video. What's the prospect here? I hear [inaudible] is possible, how about the image portion?

Elon Ganor: I'll repeat the question. The question was about integrating audio and video. Obviously VocalTec looks at everything that has to do with communication, and it's our company policy to announce and ship, and not to put any vaporware out there, so we'll stay that way.

Glen Hutton: As far as our product goes, there is a part of the product which is an element called the "Web board." The Web board will provide initially — and I don't mean to mislead either, it will not be in the initial release of the product — but very shortly thereafter the Web board will be providing still images of an individual that you're talking to, etc. And ultimately, certainly, as I'm sure VocalTec has the same plans, to introduce a video-type conferencing sort of product.

Jeremy Carl: Just to give a slightly independent spin on things... if you do want to do video on that today, there are opportunities right now. People from the very beginning of have been using it, and I'm talking about Windows platforms right now, but there are, of course, platform versions available. For people who want to do CU-SeeMe, for example, although CU-SeeMe hasn't really had an effective voice channel, people have been using CU-SeeMe as the voice communicator, and other voice products as they're available today. It is effective.

As far as the way you see multimedia come to the Net, Real Audio announced a couple of days ago, *Real Audio 2.0*, and one of the enhancements which was significant was that they're adding a multimedia component so that when you set up the stream you can actually embed a URL, so you can get a multimedia effect like a slide show as things go on.

And then there's a company, an Israeli company, that came to the show called VDO, with *VDO-Live*; if you want to see 15 frames per second at 28.8, I think it is one of the hottest products at the show. I apologize, but as far as what got my attention at the show this year, it was this VDO product. At 15 frames per second at 28.8 it's sort of showing you a little bit about what the future is going to be; and how '95 is streaming audio, and '96 is going to be streaming video.

Before we take any more questions, I think Andrew Kantor entered. Do you have an announcement of some sort?

Andrew Kantor: Well, it's kind of a... we've got the connection up, and we've got the products loaded, we've got both *Internet Phone* and *Web Phone* loaded, but Mr. Murphy has once again reared his ugly head and now it seems the microphone may or may not be working. But as you all found out about five minutes ago, the speaker does work, so we can certainly show off the interfaces. We may not be able to talk, but we can certainly listen, and we can see maybe the microphone will work. So if you want to finish up, this should be ready and we can try, we can show off your interfaces.

Jeremy Carl: We'll go ahead and I guess let you guys do that now. If you want to get toward your computers, or however you guys want to do that, and we'll attempt to actually communicate here for a second.

M: [inaudible]

Jeremy Carl: That's VDO, they're actually distributing. I mean, they're actually displaying their ways at the booth, 10 to 15 frames per second video.

[Panel]: Do you want to give the Webs to the [inaudible] part?

[Panel]: It's www.vdolive.com, also if you go to www.iworld.com you'll find references to them there, as well.

Andrew Kantor: Microphone is not working. Oh boy.

Jeremy Carl: Oh, well. In the meantime, while we play around with the microphone... further questions? Yes, the gentleman in the red.

M: [inaudible]

Glen Hutton: Yeah, there was an issue a while ago regarding that and Quarterdeck. That has since been rectified. Quarterdeck was claiming that they had rights to the trademark for *Web Phone*. We also, the Internet Telephone Company, also claimed to have rights, and at this point, Quarterdeck has backed down. So I assume that they have acknowledged our rights to the name *Web Phone*.

[Panel]: Was it just the name or was it the same product?

Glen Hutton: No, it was the name, it was not the same product. Their product is a completely different product; they have continually announced that they're probably just going to be forthcoming. I haven't seen anything yet.

[Panel]: *Web Phone* was, in fact, invited to this, [inaudible] *Web Phone* is right here. Isn't there *Web Talk* now?

[Panel]: I think it's called *Web Talk*, and that's what they're going to refer to it as.

Jeremy Carl: Web-Talk, from Quarterdeck, was invited repeatedly, they even have a large ad touting their services in some of their magazines, so I can only assume that they are actually forthcoming at some point, but they declined to participate saying that their product was not quite ready. And that's really all we can say about Quarterdeck at this point. If there's a Quarterdeck representative here who would like to clear up that, then they can, but as far as I know, it should be out imminently, but they declined to participate.

M: [inaudible]

Jeremy Carl: I'm sorry, I did this earlier, but perhaps everybody didn't hear me. Yes, Camelot, DigiPhone was invited and because they had purchased NetPhone and were sort of in the

process of doing that, in fact evidently it's gone out on the wire today. NetPhone being an *Internet Phone* product for the Macintosh, both they and NetPhone, who were invited, were sort of being a little bit cagey about sending a representative. I guess they didn't want to have two representatives, and they also didn't really want to clue us in as to what was going on with their company. So they declined to send a representative here, as far as I know.

M: [inaudible]

Elon Ganor: Actually, the way we see it at VocalTec, being a voice processing company for five years, is other companies jumping on a bandwagon after us identifying a market before them. I will urge all of you to go to Camelot and find out in how many businesses they have been over the last twelve months, starting from oil and gas drilling; and building up a chain of CD-ROM stores; they've been keeping on promising that they'll be in 200 franchise stores — there's still one, in Dallas — and some other businesses. So you have to use your own judgment.

Now, I got a phone call last week from the president of [inaudible], which was the company that actually acquired the product, just to make things clear here; and the company that acquired the NetPhone product was [inaudible] to start with, from the Electric Magic, which are very nice guys out of San Francisco that have done a nice product for the Net platform — not a very professional product in our opinion, but pretty nice for the Mac. And then they wanted us to bid against Camelot, and I just refused to bid because we are going to bring our own product, and they said these guys are going to take this product.

[Panel]: How much did they pay?

Elon Ganor: This is not something, I think, that would be ethical. I know how much they paid, and I said, "Good for them, let them buy it." Now I just want to wait and see how they're going to do the cross-platform issue, because this is not going to, probably initially, to work together. How many of you tried to use DigiPhone? How many of you actually tried to use the product? Nobody. Okay. I don't want to comment. I would urge you to try and buy it, it's worth the \$49 just to see the experience.

Jeff Pulver: Just a comment briefly about that. I actually did a review, which I haven't published, it's going to be available this week on *Netwatch*, where we compared CU-SeeMe versus DigiPhone to try and set the record straight. And after I bought the product, I actually stopped doing the review because I felt that if I was going to continue with the review I would have authenticated the fact that this was a product that was quality to buy. I felt very uncomfortable, but we did it anyway.

And we looked at it, we compared the two, and certainly if you go to the stores and you buy today, try it out; but our reaction, it was myself and three others, and we bought a product and it GPF'd immediately as soon as we took it out of the box, so it left me with an uncomfortable warm-and-fuzzy as far as functionality goes. But I'm sure it works for some people.

I managed, after six hours of phone conversations, to get it to work, but I was never able to get it to work with somebody who I didn't set up a schedule with first on the telephone to confirm, to find out whether they were available or not. But you can certainly form your own conclusions.

Andrew Kantor: If you can hear me now, and I guess you can, it means we are up and running. Who wants to go first? Do you want to arm wrestle or draw lots, or...?

Jeremy Carl: VocalTec can go first.

Glen Hutton: I insist, really. You guys are the leaders — go ahead.

Elon Ganor: They want us to be first, and there's a very good reason for that. They've been watching what we're doing for the last eight months, and I want to tell you something... VocalTec, over the last eight months, has released three products to the marketplace [inaudible]. At the time, now only about 14. They may well understand what it means to bring three products, and when I say three products, February 10th, we had *Internet Phone*, on June 5th we announced [inaudible] and we were shipping the same day. And September 25th we announced and shipped Internet [inaudible], which is a competitor to real audio.

Obviously you may well understand that this product is Version 1.0, and it's been out there eight months with one million users. So you have the basic features. [Inaudible] wants to show his product because it probably has more features, but we [inaudible]. Obviously they did. Other products coming and those are not going to have them, in the very late future, but rather in the near future. So you have to keep that in mind.

M: [inaudible]

Jeremy Carl: While we're waiting through this uncomfortable laughter, if there are any further questions... Yes, the gentleman right there.

M: Maybe you already covered it, and I came in late, but what about AT&T? Where do they sit? What's the deal? I mean, don't they have, aren't they concerned about this?

Elon Ganor: Let me explain, do you mind? The way we see it... this question has kept coming up over the last eight months all the time, and there are very basic things we need to understand. There are various market segments here we're talking. It's a very big business — voice is going to be very big business. It is already, for the telecom guys, and on the Net, it's something different.

Let's take, for example, what Jeff here was describing, the ham radio type. Ham radio, in order to become a hobby you need to go through some tests that you have to be qualified by the FCC, that's one major barrier. And you have to spend a few thousands of dollars on equipment. And after jumping those two barriers, you end up with one million ham radio hobbyists worldwide. Now take those two barriers away, and how many people would love to, he said, "I don't know why I do it, but I do it. I just enjoy chit-chatting with people all over the world." And I guess it'll be more than one million people that would love to do that, and actually *Internet Phone* proves that fact, and without the barrier.

So the market for those guys are maybe five million, maybe twenty million, I don't know. I have no idea, because it's hard to find out, and just jumping and testing it, and it seems that many, many people would love to do that. So that's happening. And that's one market — you don't do that on the phone — never with an AT&T connection. You don't pick up the phone, call someone and say, "Hey, how are you? How's the weather there?" because he's going to hang up on you, believe me.

My mother has a sister in Australia, and she calls her five, six, seven times a year to wish her a happy holiday, happy birthday, happy something. And she's watching her watch, and she's counting, and she doesn't do it long because it's about \$4 a minute. And so she just doesn't use it... and that's a major thing. That's a very important thing. Now imagine if she can actually start

talking to her sister, chit-chatting and gossiping, even though the quality of communication is not the same.

One thing I have to make clear here. This is not a phone-quality. It's not the phone. It's not replacing the phone, and everybody, they're telling you that this is replacing the phone and that is just not the truth. It has delays, and the delays have nothing to do with the quality of engineers we have — it has to do with the Net. It will improve; this is ground-level. We just established ground-level. So we have a sort of between half a second to two second delay on international calls, and it depends on your access provider, on the type of PC you're using, on the type of modem you're using, the connection you have. There are many, many factors. You have to do it seriously. So that's another market that today is not being at all addressed by any of the phone companies. Just give them the capability of [inaudible] for two hours on a long distance with a minimal cost.

Even though the quality of communications, there's a cost/performance issue. Then we're looking at the competition where we're seeing already small businesses and medium-sized, and we have some things in the pipeline for them. In the corporate environment this product will be able to either [inaudible] or do other things than just voice communication.

And as a matter of fact we came from that angle, and we decided to jump into the consumer thing and the whole IRC that you're seeing, some people will attack on that. We see that as a tremendous advantage. Because, mind you, there is a bootstrap issue.

One of the frustrations people have is that when they're trying to use DigiPhone, when they finally, after six hours, as Jeff said, succeed in installing it, they have nobody to talk to. Then you need to set up somebody on the other side to talk to. And here we're giving you the opportunity to meet other people and start communicating with them; and they are divided by interest groups, that address, the Internet community, the one that actually pushes the Internet to what it is today.

By the way, you don't have to be on all those channels and [inaudible] has a private company channel, and we are not on all the other channels, and you don't need to meet all those people. That's one mistake Glen made here. But you can be on your own company. We have a VocalTec private channel and that's it.

Jeremy Carl: Glen's going to, I think, briefly answer that, and then evidently we do have the network back up and running. Glen will defer for the time being for the 3.5 seconds we'll probably have this network up.

M: My name is [inaudible], Technical Director of VocalTec and one of the company's founders. And this is the [inaudible] we interface off the *Internet Phone*. What we can see here is ten quick-dial buttons that you can use for users that you are frequently calling. So you can set those to anyone from your business family, or just friends that you're frequently talking to. We have a toolbar here. I'll press the call button and what I'm getting is a list of users that are currently on-line on the Internet and using the *Internet Phone*. We have a network of servers that we call the *Internet Phone* servers because they are dedicated *Internet Phone* servers all over the world. We have them in Europe, we have them in Russia, of course a lot of them in the U.S., we have them in Japan — all over the world.

And I kind of think that I lost the Internet connection again here. So let's do a dry run here.

Basically here, if you're pressing the refresh button and you have an Internet connection, you're getting a long list of topics that are currently available. Those topics can be either public topics or private topics. Public topics are topics that people are creating in order for other people to join them and talk about subjects they like. We have a lot of topics for people that

are only speaking Portuguese, or Chinese. We have topics for Russia, Israel. We have topics about computers. One of the first topics that was created was by a guy called Paul who created a topic to sell his boat. So he put the type of the boat, and some details in the topic, and people were joining the topic in order to get the boat from him. At least in each topic like this, that we can't see right now, you have at least one person that created it. If all the people from that topic are quitting the topic, the topic will disappear. So those are public topics that anybody can join.

If you want to create a topic for your own family or your own business, you can create a private topic which is not listed in the list of topics. Private topics are topics that are not listed in the main list of topics. And those topics are created in order to have a telephone call which is not listed in the global telephone directory because with the *Internet Phone*, it's very easy to call anybody that is on-line. So maybe to give a personal example, we have five computers in my family, and we have a private topic of our own, and every day we have a schedule that everybody is talking together. My sister lives in Long Island. I'm living in New Jersey. My family lives in Israel. And we're all joining up for a conversation almost every day.

For the business, we have a private topic that we're having almost daily meetings in VocalTec because we have our research and development facilities in Israel, and...

Here is the Internet [inaudible] topic and we can see some people that joined it. We can see people on the show floor. We have a few people of our own, and a few other people. But let me search randomly for a user that I can talk to which is not on the show floor.

Hello, I need a volume for the computer. Hold on for a sec, I have to set the volume level here on the computer probably. I'm already connected to user, but unfortunately... No? No.

Matt, can you try and talk to us? He is talking, but still no audio.

Hi, my name is [inaudible], and I'm doing a presentation in a computer show called the Internet World in Boston.

Hi, can you please tell us where you're talking from and how you connected to the Internet?

M: [inaudible]

Elon Ganor: The sound quality here is not really great, so I'll try and set...

Matt, can you tell us for how long are you using the *Internet Phone* and who you spoke to when using it?

[Matt]: [inaudible]

Elon Ganor: Okay, great. And what about the quality of the calls? We have a lot of people that are not actually listening to a great quality right now because we have a problem with the amplified system, but can you, do you have any comments about the quality of the calls that you had world-wide?

[Matt]: [inaudible]

M: I see. Okay. Thank you very much, Matt. We'll try and have one more conversation, so thanks a lot and bye-bye for now.

Okay. It's not the greatest demonstration because the audio quality over the PA system is not great, but you can see that we have continuous flow of audio from the computer, and the conversation is fluent. Let's see if we can talk to someone else.

[Panel]: Let's actually, I'd like to let Glen have a chance to demo his product, and right before then I'd also like...Elon would like to say something.

Elon Ganor: Yeah, I'd like to mention, and to specify a few words about quality and the quality of voice communication. It has a lot of factors. One single factor is probably the most important affecting the quality of the voice you are listening to is the microphone on the other side. Most people are buying a multimedia machine. They don't have a microphone at all, or they get a very cheap \$2 type microphone; and this will affect tremendously the quality of the receiving end.

The other thing is, obviously, the type of audio board you're using. If you're using an 8-bit old 91-type audio board, the quality is real bad. And then if you go for 16-bit or 32-bit type board, the quality improves very much. This will affect any product. It doesn't matter whether it's *Internet Phone* or others.

Then the access provider has a lot to do with it. You see a lot of Internet access providers are "ma and pa" type operations in a garage, having a T-1, and then they start selling Internet accounts to their neighborhood. And if they do it for 20 people, there is a lot of bandwidth available — there is no problem. This product takes about 7.7KB on the compression side, which is really not a lot. It's about half of a 14.4 modem, and that's why it works well with a 14.4.

On the other hand, if they are overselling, if that particular access provider is overselling his services to a couple of thousand people on a T-1, then obviously you get, when you're running a browser, the graphic interface will appear slower — you are willing to tolerate that. But with voice it will start being choppy, and there is nothing you can do about that. So our recommendation is to go only with the big, good guys that provide good access. And now we start seeing companies like PSI that just announced on Monday more bandwidth, and more secure type of capabilities.

[Panel]: We have a *Web Phone* hopefully ready here, and we're going to give it a demo.

Glen Hutton: Just so I can let you know, this is our alpha version. If, unfortunately, if we were like three days later, we would have the beta version ready to roll. And let me restate that position. The beta version, the reason why we are not able to bring a beta version to the show, is because obviously we have a lot of — as you can see from the user interface — there are a lot of things that have to be hooked in. The audio engine is all there, we just need to finish the final hooking-in of these images into the application. And I'll explain our product to you in just a moment, but in the interim let's try and make a call so we can get this puppy done and over with here. And here we go...

Andrew Kantor: Who are you calling?

Glen Hutton: I'm calling my office.

Andrew Kantor: You put in an IP address?

Glen Hutton: Yeah.

Andrew Kantor: So you're using an IP address like a phone number.

Glen Hutton: Correct.

Andrew Kantor: What about dynamic IP addresses?

Glen Hutton: Dynamic it will handle.

Andrew Kantor: Is it still ringing?

Glen Hutton: Yeah, it should be. I'll try again.

We have other people to connect to if this connection doesn't work for whatever reason. What network are we on?

Andrew Kantor: IBM's.

Glen Hutton: IBM's network?

Let me put that one on hold. What I'm doing now is I'm actually placing that line on hold, and I'm going to now dial another number.

[Phone Machine]: On hold...

Andrew Kantor: Oh, you've got to be kidding.

Glen Hutton: Yeah, the phone actually enunciates everything. There's a lot of, for lack of a better term, there's a lot of — I don't want to say it. There's a... it's a sexy application, okay? There's a lot of bells and whistles put into this. The product has been very well-tuned and very well-designed.

Okay, let's try. This is a connection to Boca, if we're still up... Hello, Steve? Hello. Steve, buddy, how are you doing, man?

[Steve]: Glen, are you there?

Glen Hutton: Yeah, I am Steve, can you hear me? Yes, Steve. Steve, hello? All right, let me try this one more time, let me disconnect.

[Phone Machine]: On hold. On hold.

Glen Hutton: Now what's really occurring here is Steve is actually placing me on hold, and that's why this is being enunciated.

Andrew Kantor: Is the microphone live or...

Glen Hutton: Yeah, we may be over-intenuating with all the background here.

Hello? Steve, all right, let me put him on hold. Whoops.

Anyway, one of the things that I wanted to show, obviously, is the audio quality, and I think in all fairness, just to prove my point, we should allow VocalTec... I would like to invite VocalTec actually to redo the conversation. What I did was reconfigure the board so it sounds a little better for you guys.

Andrew Kantor: Let them try and demo it at least.

Glen Hutton: Steve? We must be getting feedback from something.

[Steve]: Glen?

Glen Hutton: Yes, Steve.

[Steve]: Yes sir, you had a little bit of background noise in the room there that was keeping your mike open, but I hear you fine.

Glen Hutton: Yeah, I know. I apologize for that. Just setting up some of the parameters. How is everything in Miami? All right?

[Steve]: Everything is just wonderful.

Glen Hutton: Beautiful. You're coming through loud and clear, by the way.

[Steve]: That's because I'm using the telephone product that I got in the mail today.

Glen Hutton: That's very good. It wasn't called the *Web Phone*, was it?

[Steve]: No, no, it's called the *Sound Exchange*, and it's from a company out in South Dakota.

Glen Hutton: Yeah... You're a little slow today Steve. That's okay, no problem.

Anyway, you were talking to, I don't know, maybe about 125, maybe 200 people here, so do you want to say hello to everybody?

[Steve]: Hi there guys, I didn't realize I had an audience, but my name is Steve, and I'm down here in Miami. We're talking on the *Web Phone*.

Glen Hutton: How is Shane doing? Is he hanging around?

[Steve]: Shane is being a trooper. He actually said he wanted to talk to you at the show, and for me to get your address and I'll forward it to him.

Glen Hutton: Okay. You have the IP, so why don't you do me a quick favor and call him on the other line? Put me on hold, call him and have him give me a call. Will you please?

[Steve]: Will do — no problem.

Glen Hutton: Thank you.

Andrew Kantor: Okay. I've got a couple of questions while we're waiting for this. I want to talk about the interface because let's assume, as we'll see when VocalTec tries their product again in a minute, that the quality of the phone calls is about the same, with the setting set properly. With VocalTec's *Internet Phone* you log into a special IRC-like channel, get a list of users currently waiting, and then connect to one of those users. Is that right?

Elon Ganor: Right.

Andrew Kantor: And then when I connect, if I feel like chatting with someone, I'm going to be logged into this channel, my name will be listed with the others, and then if I want my friend Eric to call me he'll look at my name, see that I'm on the list, and he'll be able to call. So we both have to kind of arrange to be on-line. Meanwhile, other people can call me as well?

Elon Ganor: [inaudible]

Andrew Kantor: Other people may call me, and I'll see that it's not who I'm waiting for, and I can tell them, "Sorry I don't want to talk to you." Which seems to be fine if my name is Andrew, but tough if my name is, say, Tonya. Because I'm going to get more calls that way. So we're going to both arrange to be on a channel or be on a topic. Can he call me, and can I be listed there, or can I not be listed there, but still be waiting to receive a call? Like I'll say I'll be on-line at 2:30, call me. Can he do that? And without having anyone else know that I'm there?

Elon Ganor: Well, you need to put a nickname because you need to be able to click on a name in order to connect to, but you don't need to put all your information. You decide whatever you want to put there.

Andrew Kantor: Okay. But people are going to see me on the list. It's possible I'll get other calls. Okay, I can have a private channel. Now with *Web Phone*...

Glen Hutton: Excuse me, I have a call coming in. Just a moment. I don't mean to interrupt the show. Hello?

[Shane]: Yeah, Glen, this is Shane. How are you doing, man?

Glen Hutton: I'm doing okay, buddy. What's going on?

Andrew Kantor: How much has he had to drink today?

[Shane]: We're trying to figure out how to replace or turn off the VGA card that's in this NEC-ready computer, and replace it with an [inaudible] graphics, and there's nothing in the user manual about it.

Glen Hutton: Well, I'll tell you what, Shane, right now you're speaking before about 250 people, so we can discuss the technical problems later, perhaps.

[Shane]: Well, if there's somebody from NEC there, tell them that there's nothing in this user's manual how to disable the damned VGA.

Glen Hutton: You got a laugh, buddy.

[Shane]: By the way, there's something else — their video driver for Windows 95 has a bug.

Glen Hutton: Hopefully there's nobody here from NEC. Didn't we have a deal that we were cutting with them? I forget now.

[Shane]: Actually no, that's the one computer manufacturer I didn't talk to yet.

Andrew Kantor: Okay. Okay. Although we appreciate NEC's troubles, we do want to let VocalTec show off with a little better connection. But I want to ask you some questions about your interface.

Glen Hutton: Are we going to do that while we have Shane on the line, or do you want to discontinue the conversation?

Andrew Kantor: Let VocalTec connect real quick, and before they go, I want to ask you some questions while they're setting up.

Glen Hutton: Okay. Shane, we're going to blow out here. Thanks very much and I appreciate the call. I'll give you a call in a little bit.

[Shane]: You're going to hang up on me?

Glen Hutton: Yes Shane, I have to hang up on you, buddy.

Andrew Kantor: Now with your interface, as we saw with VocalTec's, the list of the users on a particular channel...

Glen Hutton: Shane, thanks a lot, I'll talk to you later, bye. Shane? Shane, you can't call any more, good-bye.

Andrew Kantor: Now with VocalTec's we see we have the channels, and you look on the channel, and you see who's there, and if the person you want to speak to is there then you can speak to them. With *Web Phone*, how does that work if I'm dialing an IP address? Or how do I, if I want to get in touch with someone, how do I do that?

Glen Hutton: To answer the question... regarding the alpha version that you're seeing here, it only allows point-to-point communication through an IP address. This product has basically been released to various hardware-level manufacturers. VocalTec has discussed their product being bundled with a lot of other computer peripheral products, etc. We also have similar deals, some of which many of you will be surprised and probably so will VocalTec, but that's okay. The bottom line is that we, for the alpha version, did not require the ability to use the connection server. On the 6th of November, when you'll be able to download the beta version, all you will need to know is the person's e-mail address. You will not be required to have an IP address to speak to somebody.

Andrew Kantor: So as I was asking you before...what about people who have dynamic IP addresses? How is it connecting? It's just going to go to the IP address?

Glen Hutton: Right.

Andrew Kantor: Find that person...

Glen Hutton: The magic is all performed by us. All we need is your e-mail address and we instantly find you.

Andrew Kantor: Okay. VocalTec is ready. Let's see if we can talk to someone.

Elon Ganor: We lost the connection. We lost the Internet connection again.

Glen Hutton: Now if I may point out...it seems that every time we use *Internet Phone*, we lose this connection. Is something going on? Is it you, or is it just a coincidence?

Elon Ganor: It's not us, believe me.

Glen Hutton: Okay. It's not you.

Jeremy Carl: Question back there while we're waiting.

M: [inaudible]

Andrew Kantor: How much bandwidth do either of these products require? What kind of modem do you need? Do both people need to have high-speed connections?

Glen Hutton: The minimum required for our product — and VocalTec, in that respect, the minimum requirements are very similar — a 14.4 modem, and correct me if I'm wrong, any 486. Okay, likewise with us as well; and a connection to the Net and a multimedia compatible sound card.

By the way, VocalTec also has mentioned the fact that their product is full-duplex. I will go on record stating our product is also full-duplex, as well, for those of you where that is a concern.

Andrew Kantor: Something about full-duplex. Full-duplex requires a full-duplex modem, which is not something you just run out and buy that easily.

Glen Hutton: Audio card.

Andrew Kantor: I'm sorry. Full-duplex audio card, which is not something that you run out and you don't buy as easily as you...

[Scott]: Hi, how are you doing? This is Scott from Internet World. How are you?

Elon Ganor: Hi Scott. It's Elon from Internet World also. I'm here demonstrating the *Internet Phone* before a very large group of people.

[Scott]: Great. We also have here about 20 people, and giving a demonstration of the *Internet Phone*, so where exactly are you anyway?

Elon Ganor: Okay. I'll try and call someone else also. If you have anything else to say to me, please do.

Guess not.

Andrew Kantor: I want to say about full-duplex... if you don't have a full-duplex sound card, you can't do this. *Soundblaster 16s*, the normal cards that come with multimedia machines, are not full-duplex sound cards. There are a few of them out there, but we have a *Soundblaster 16* right now in this machine. We cannot do full-duplex.

There's a big controversy going on supposedly right now in beta, at Creative Labs — and if there's anyone here from Creative, come see me afterwards. But we're all waiting for the driver to be available. I've gotten private e-mail saying it's actually available, and once the driver is downloaded your SP-16 will work full-duplex. Okay. So real soon now it's going to be full-duplex, but the point I wanted to make is — it's not like you're going to say, "Oh, I've got a fairly new sound card, a *Soundblaster*, it's going to work just fine." Not necessarily; in fact, chances are you're not going to be able to do full-duplex without either this driver that's coming out or a completely different sound card. One of the things... when we were preparing for this, we wanted to do full-duplex, but we couldn't find a full-duplex sound card. Yes?

M: [inaudible]

Andrew Kantor: How do you know who's on-line in *Web Phone* ? We'll get back to that in a second.

Glen Hutton: How do you know on *Web Phone* ? *Web Phone* has a built-in user directory. There are two levels of directory. There is a directory system which resides on your machine, sort of like an address book. And then there is a connection server, which is really the ITTEL WorldWide Web directory listing. And so you can literally go to that and search for an individual. It's interfaced directly into the phone, that sort of liquid crystal display that you saw up on the screen allows you.

If we have time, I'll quickly run through some of the applications and some of the interface modules of the phone. You literally can do queries and sorts, things of that nature, to find out an individual's name or address.

Andrew Kantor: Yes sir.

M: [inaudible]

Andrew Kantor: How much bandwidth does *Web Phone* use? CU-SeeMe says they use 7.7 KBs per second? What does *Web Phone* use?

Glen Hutton: The sampling rate — now this is very confusing. There are really several elements in this. It has to do with the bit resolution of the audio file, and there is also sampling rates, and there is also the throughput of the audio file. We sample at approximately 8,000 a second. The throughput is roughly 1.1K per second for audio. Yes?

M: [inaudible]

Glen Hutton: Okay. Conference calling is only available because of the amount of overhead required to do conference calling, it's only on a 586 machine. It's not so much decompression that is the problem, it's compression that becomes the problem, and so a 486 just does not have the guts to do it. That's the bottom line. Go ahead.

Elon Ganor: We don't provide that capability at this version.

Andrew Kantor: So neither of you provide conferencing, three-way calling, not yet. With a Pentium or 586 you can. You both do re-dialing, you have the buttons, you have the re-dial function. Will *Internet Phone* allow calling a specific person the same way without having people

listed on a channel? Is that something that's coming out? I want to call somebody, and I know his or her e-mail address, or IP address...

Elon Ganor: The product that was released in beginning in '94, [inaudible] was doing exactly that at that time. So that's something that is... the name server is something to solve a problem that exists. So calling someone with his IP address is easy thing to have, and we have that in a former product. So in the future you'll see that.

Andrew Kantor: Okay. VocalTec is going to try another quick call. It seems, at a first glance, that VocalTec is kind of like almost a CB radio, or you join a channel, you see who's there. It's like IRC, but with voice. You join a channel that is used there, and get into a private chat with them that way. Whereas *Web Phone* is more — dial an individual user from your own personal list, and they are waiting for your call, and there's not a public list. Is that not correct?

Elon Ganor: Well, that's not exactly correct because the way we are...

[M]: Hi, can you hear me?

Elon Ganor: Can you please tell us where are you located and how you are connected to the Internet?

[M]: Yes, I am located in VocalTec offices in [inaudible], it's near Tel Aviv in Israel. And we are connected through a direct connection to our service provider in the 64KB.

Elon Ganor: Okay, great. Thanks a lot. People here wanted to hear the sound quality of the *Internet Phone*, so that's why I called you.

[M]: Where is the show?

Elon Ganor: We are currently at the show and we have about 250 people listening to us.

[M]: Oh, in what country, I meant?

Elon Ganor: Okay. I'm sorry. In Boston, Massachusetts.

[M]: [inaudible]

Elon Ganor: Okay. Hold on for a second.

What you can see is a 400 millisecond delay in the communication with Israel. Leo, if you can show the VT band channel. We have a company channel, so when I check into a hotel in San Francisco, I get on-line with my computer to get my e-mail, and then the second thing I do, I run CU-SeeMe, and I see who's on-line from VocalTec in New Jersey, Israel, and if someone of say [inaudible] V.P. Of Marketing is in Stockholm at the time we can all join in so it's kind of a community which is internal office, internal corporate communication tool. And that's something one has to understand. It's enhanced with one click — the capability of us talking to each other.

Andrew Kantor: Something Glen just mentioned... do you have a hold or a mute button that you can tell them to hold on?

Glen Hutton: No.

Andrew Kantor: No. Okay. Features that I'm sure will be worked out soon. We have to wrap us this session in a couple of minutes, so why don't we just chat with him for another minute? I'd like *Web Phone* to get another shot at chatting, so we kind of equal that out. Yes, question.

M: [inaudible]

Andrew Kantor: Are standards being addressed? If you're using *Internet Phone*, you cannot call someone on *Web Phone*. If you're using *Web Phone*, you can't call, you have to be using... It's kind of like Chat, different Chat systems over the Net, if you're using one you can't necessarily use another. So there is no standard. You look excited.

M: [inaudible]

Andrew Kantor: Does either product offer any kind of encryption?

Glen Hutton: Not at this point. VocalTec, obviously, is going to have something to say about that, too. Again, one of the problems is when you start to induce Pretty Good Privacy, there are legal issues outside of the United States, and there are also some problems as far as the amount of overhead required to encrypt a signal further.

Jeremy Carl: Let VocalTec answer.

Elon Ganor: Well, the issue of privacy over digital-type communication is less severe than people tend to think it is. The product has compression, other algorithms to do reconstruction of lost packets, the delay-handling mechanism. In order to be able to tap on that, you need to do a whole reverse engineering of the software. It's pretty complicated. I would say it's a whole form of encryption, really. And actually tapping an irregular form connection is, by far, easier than doing it to an CU-SeeMe-type communication. In the future we'll be offering more specific encryption coding.

Andrew Kantor: Actually, we're going to let *Web Phone* connect one more time, and then we're going to have to close the session down, but we invite everyone to stay after. I'm sure they will be eager, both VocalTec and *Web Phone*, to answer your questions. And *Web Phone* is just going to do a last demonstration here.

Elon Ganor: Thank you. I'm going to hang up now. Bye-bye for now.

Glen Hutton: Who do you guys want to talk to? Do you want to talk to Steve or Shane?

M: [inaudible]

Andrew Kantor: Do either of the products do any kind of voicemail?

Glen Hutton: Yeah, our release that's coming out on Wednesday, or on the 7th, will have, does have voicemail built into it. And that is whether you are on- or off-line.

Andrew Kantor: So you just have to have the program running? And if you're not there? And if you don't answer it it'll just take voicemail?

Glen Hutton: That's correct. It'll allow you to leave a voicemail message. And also too, we obviously don't have the time to fully demonstrate it. I invite all of you, at this point, to, if you have access to the Net, go to www.itelco.com and download the multimedia help system. That will explain to you everything. It is, again, ten times more informative than I have time to provide you with information.

M: I want to ask VocalTec... do you plan to offer any kind of voicemail?

Elon Ganor: Well, as I said, we don't discuss future plans. The product right now does not offer voicemail.

Andrew Kantor: It does not, but they may or may not in the future. Any other questions?

M: [inaudible]

Andrew Kantor: Do you use TCP or UDP and what are the implications in terms of firewalls if you only use UDP?

Elon Ganor: We use UDP, and the implications are that firewall's operators. The system operator needs to set it up. We give the technical support in order to set it up in a way that will allow CU-SeeMe to work with it.

Andrew Kantor: Glen, do you use TCP, UDP?

Glen Hutton: Yeah, we use TCP to make the initial connection, and then at that point, UDP. And there are obvious reasons why UDP was chosen by anybody doing this kind of technology — because of potential delays in trying to reorganize the packets.

Andrew Kantor: Are we connected yet?

Glen Hutton: No, I'm working on that.

M: Could you just confirm? Did you say you use 1,100 bits per second, and that's the bandwidth required?

Andrew Kantor: 1,100 bits per second, is that about what you're using?

Glen Hutton: Yes.

Andrew Kantor: I find that fantastic.

Glen Hutton: What was the question again? I'm sorry.

M: 1,100 bits per second.

Andrew Kantor: 1,100 bits per second.

Glen Hutton: I.IK is what I said, no? Did I say that?

M: [inaudible]

Glen Hutton: It's about, I apologize, I'm sorry. It's around I.IK.

Andrew Kantor: It's around I.IK, the bandwidth that you're using.

Glen Hutton: My mistake.

Andrew Kantor: It's around I.IK, the bandwidth they're using, which is why a 9,600 modem won't do the trick.

Glen Hutton: Yeah, that's right. I have a cold, and I'm on drugs, and numbers are a little funky to me right now.

Jeremy Carl: Question over here, yes sir.

M: Two questions, one having to do with standards, and the other having to do with voicemail. Where is the voicemail stored? Is it stored on the server? And regarding standards...is there a standards committee or standards group working [inaudible]?

Andrew Kantor: Okay. So Glen, where is the voicemail stored?

Glen Hutton: The voicemail information ends up being stored on your local POP mail server. So wherever your mail resides, that's where the audio resides.

Andrew Kantor: Okay. Audio resides on the POP mail. Is there any kind of standards committee being set up to maybe link these products eventually?

Elon Ganor: Well, there are some talks about that within the Internet community, but nothing that is specific addressing this between the two different companies.

Andrew Kantor: Okay. So there is some talk, but it's not there.

[Panel]: I would just suggest that for those of you who are really worried about standards, come in another nine to twelve months when the marketplace has been set. I think you could just make a logical conclusion that there is a need for everyone to be able to talk to each other, and whoever the leaders are at that point, you probably will see a convergence of everyone working together to talk to each other.

Jeremy Carl: Okay. We are going to have to wind up. There's a question in back. There was a hand that was up for awhile, I want to take that one question, and then we're going to wind up. Unfortunately, there doesn't seem to be anyone on-line right now. No one to talk to. Yes, sir?

M: Is *Web Phone* going to come out with a Mac version?

Glen Hutton: Yeah, it's in the works. We're actually going to come out with a full-blown 32-bit application hot on the tails of the release of this product, and then we'll be coming out with a Mac version afterwards.

M : [inaudible]

Glen Hutton: I don't have a specific date for you. It definitely is a planned product to be released. The date I can't really say.

Jeremy Carl: Okay. Thank everybody for coming. We're glad we finally got to see the products up there.

HOT NEW TECHNOLOGIES THE WIRELESS FUTURE



MODERATOR

Jane Dysart

Partner, Dysart & Jones Associates

SPEAKER

Larry Bestor

President, American Technologies, Inc.

Jane Dysart: Larry Bestor is presently Chairman of American Technologies, and there you saw a brief preview of some of the products we've developed, and hopefully some of the products that we are going to be developing in the future.

The first thing I'd like to do, before I forget, is thank you all for coming. I know it's late in the day and a lot of us have had a long day. So I'm going to hopefully give you something that's going to be of interest to you and make it worth your while for being here this late in the afternoon.

Larry Bestor: A brief overview of what I'm going to be telling this afternoon is hardware devices, software applications, various wireless communications networks as well as the feature capabilities and uses.

There was a bit in that video you just saw about the current applications. We're going to be talking about future applications, which are really exciting to me because I believe the future in technology, in both Internet access and communications, is in wireless. When you see the prices — and we are going to talk about that a little bit later — you'll find it as exciting as we do.

First of all, wireless access to the Internet. How do you do it? Who has it? What are the uses of this technology now? What's in store for the future? We are going to talk about GPS, we're going to talk about GEOs, we're going to talk LEOs, all the wide-area networks.

First of all, a little bit of background on the global positioning system satellites that were launched by the Department of Defense. [They were to be used] primarily for military purposes, but have now gone into wide scale commercial usage. They were done as a defense measure for guiding satellites, and for use in navigation for aircraft, for military aircraft in times of war.

As it turned out, those twenty-four satellites that were put into orbit over the last ten years have grown tremendously in the use of surveying and commercial use, for navigation purposes and for guiding cars, as you saw earlier. In Japan there are approximately 500,000 navigation systems in cars that will be sold this year. In the United States there is maybe 3,000. So there is a tremendous growth market that we'll be seeing here in the United States if Japan is any indication of what we're going to see.

Next is the GEO satellite, the geo-stationary satellites which we use for communications purposes. Some of you may have heard of or be familiar with the INMARSAT satellites by Intel Sat. These are in 25,000 mile orbits, and are geo-stationary satellites that are used by AT&T, MCI, and others for long distance overseas communication. For data communication here in the United States, we use COMSAT, COMSTAR3, COMSTAR2 and SPACENET3.

Coming in the near future — and being led by Orbcom, a subsidiary of Orbital Sciences Corporation and a company that we develop software for — is the low orbital satellite Radium. You may have heard of it, it's Motorola's project. CTA Space Systems, astronaut Rusty Swigert's company, is jumping into this marketplace. They had a little bit of a bug with a key

launch vehicle earlier this summer, which resulted in blowing up the satellite! But they hope and plan to launch another satellite next year.

Thus far there are two low-earth orbital satellites; Orbcom is in orbit already. Half the work's been done by us, and half by a dozen other companies. The low-earth orbital satellites will be a vast mesh of 30 constellations, of 36 communications satellites in orbit 500 miles above the surface of the earth.

What's exciting about those satellites is that with hardware that is very inexpensive — that is, under \$800 — you'll be able to transmit and receive wireless data communications in a little piece of small hardware with a low power requirement, because of the lower orbit compared to the geo-stationary satellites we have to use today for communications. That's tremendously exciting technology, and we'll see it in '96 or '97. Orbcom plans 26 more satellites over the next two years, and the other companies that I mentioned will be launching their networks, and their constellations will be up.

So by 1997 or 1998 you'll see widespread use of low-earth orbiting satellites for data communication as well as voice communications, and [you'll see] wide-area networks widely in use, as you are probably already aware of. Many of you use a wide-area network if you're in a corporation, a larger corporation that has an enterprise-wide, multi-campus networking problem that they had to solve. Instead of wiring with an infrastructure of hard wiring, they would use a series of radio modems to set up your network.

The biggest [company] — we'll talk about it later — that seems to really be taking the bull by the horns with this is Metrocom, and they're actually rolling out, from city to city, a network or multiple networks of radio modems.

We'll talk first about the satellite access systems, and this system diagram right here basically shows you how a typical tracking and communication system works. Signals are received from a GPS satellite to a mobile unit, maybe a truck or tractor [trailer], and that mobile unit then transmits that position through a satellite transceiver to a geo-stationary satellite; that in turn gets forwarded to the air station, and then through the Internet [where it] can be received by the dispatch side. Anybody that wants to track those vehicles gets that information via the Internet right now, and that's recently a development of the project that we undertook over the last year as a response tool.

A lot of requests from our customers say they want to have a less expensive way to get to satellites, instead of having to dial long distance to the land/earth station. On the coast and internationally there are only a few INMARSAT stations, and they wanted to be able to boost to those land/earth stations less expensively. The Internet became that pipeline, and as a result has been very well-received. The exciting part about that is that it's two-way communication, so those mobile units with a terminal keyboard there in the truck, or inside police cars, can send and receive messages anywhere over North America using COMSAT satellites, and internationally using the INMARSAT satellite. There is a picture of the COMSAT earth station in Maryland, and the dispatch center way out there.

As you can see in the background, there are multiple workstations all tied into the primary dispatch. That happens to be one of our favorite designs, because the central communications fellow sits in the center of a round architectural design in which multiple dispatchers can feed information back and forth to him and communicate.

Current system users include police departments across the country, and we're working with IBM to distribute it in central America — apparently theft is a big problem down there, theft of police cars by police, I think. Truck fleets are the biggest users of the commercial technology here in the United States.

In the United States, commercial fleets make up the major portion of the business; it's about a \$400,000,000 a year business right now by commercial carriers — class A trucks,

primarily. The airlines are using it, and they've been using satellite communications and GPS navigation since it became available. [With] the U.S. military, we have installation at Port Seal and a couple of others where the military has been using it primarily to coordinate command-and-control systems and field operations.

Some of the communications hardware that's available that we've all used, and will eventually be able to go through satellite: cellular phones, pagers — Skytel and M-Tel we're working with, and they've developed an e-mail messaging software that dovetails with our tracking and communication software so they can send e-mail messages through a pager unit, so if you have an inexpensive pager you can use their software to send and receive messages via the Internet — satellite radio transceivers of course, PDAs and notebook computers — notebook computers who are already using PDAs will be used. We don't have any currently in the field, but I see PDAs as a big platform in the future as well.

Here is three-quarters of a picture of a satellite transceiver. For some reason it didn't paint the rest. But with the transceiver itself, you can see the size of it; it's quite substantial. This is a satellite transceiver that [we] would see today, for reaching the COMSAT satellites.

And if we have — reboot, where is reboot? Okay Windows, let's go. Hey, we're all familiar with that, aren't we? This is one of my favorite guys, and that's a Pentium. Well, while we're waiting for Windows to catch up, we'll talk about the Metrocom network as well — there we go — and the availability of that network as it continues to roll out in certain communities.

There is certainly a growing interest in wide-area network technology as well as satellite technology, because of the ability to latch on and be able to send and receive multiple communications, as well as voice communications and data communications, high-speed data communications.

The exciting thing to me about that particular technology is that you will be able to get throughput up to 28.8. Currently we have a limitation of speed through the existing satellites; on the inbound we've got a limit of 14.4, and on the outbound we've got a limit of 48,000 — so speed's a bit higher in that particular network, although it does have localized access only.

[There's a] fight to see if the speeds that we have in satellite are in wide-area networks and ISDN lines, for instance satellites. Well, it's not even going to let me [get] that far this time.

M: [inaudible]

Larry Bestor: This time I'm going to reboot, it looks like.

Let's talk about the future uses we see coming, future uses of satellite technology. We have current communications needs in the transportation industry and in the police department's emergency vehicles, and those will continue to grow and develop. Right now in the transportation industry for instance, communications are required of those transportation carriers that work for the manufacturing facilities, the manufacturing operations in the automobile industry. They actually require that the carriers have to have satellite tracking and have to have mobile communications of some kind.

Cellular is one option, but a very expensive option. It typically runs \$65 to \$300 per month, per vehicle. Right now we can provide satellite tracking and messaging for \$50 per month unlimited, for messaging and communications. [That's a] tremendous cost savings; a recent customer said he paid for this system in the first seven months.

So there is tremendous cost advantage right now and inexpensive data communications via satellite.

M: [inaudible]

Larry Bestor: Hardware? Right, sellers will give it away, almost. Their hardware for tracking, however, is about \$2,000 from a company that's big in that business, [inaudible]. The cost for satellite tracking equipment right now is \$3,000 to \$5,000 if you're in the United States; internationally, using INMARSAT it's about \$5,000 per vehicle. So it's still a high-end piece of hardware, and that's why it's so exciting to see low-earth orbiting satellites coming on-line; once those satellites are available, with hardware that starts at \$800 — and that's pricing from major manufacturers that have been licensed to make the radios. Panasonic is one, SCI out of Huntsville is one, and an Israeli company that will be manufacturing radio.

So there are more manufacturers of hardware that will be licensed to use the technology to manufacture the radios at \$800 — it seems feasible that within the near future, within a year or two after that, we'll have \$500 radios available.

M: [inaudible]

Larry Bestor: Well, currently that's set up specifically by carrier, so that it's like a door-to-door service as your own mailbox on an e-mail service. It works exactly the same way. The only person that can track you — they'd have to have the software, they'd have to have the mailbox name and ID and password in order to get in and track your positions. And that's the same for all fleets, so everybody can track their fleet but not somebody else's. And vice versa for communications.

There is growing demand and a growing need, I think, for inexpensive satellite communication, inexpensive wireless communications. Metrocom is trying to meet that need in localized areas in Silicon Valley, and many campuses — University of Illinois, Stanford University, half a dozen other college campuses — by December of this year they're talking about having mesh topology in place for their technology. By the end of 1996 they are talking about four more cities: Houston, Los Angeles, Washington D.C., and I forget the fourth one. So that mesh will continue to grow.

That topology is set up so a network of wide-area radio modems, spaced about a half mile apart, cross over their radio capabilities so that theoretically when you're in that city you have a radio modem. You lease it from them for \$300, and for a \$30 a month fee you can access your office or the Internet or anything else via radio modem.

So if you're out there mobile, or you're out there in your boat or in your car or whatever, you can get that wireless modem mesh and get to anywhere you could with the hardware or connection. That's available in local areas already, and will be available in more and more localized areas.

But I think that when you consider the implications of a satellite-based system — you have total coverage, endless coast-to-coast coverage. For a little more dollar output per month, you can have coast-to-coast and virtually continent-to-continent coverage. Right now with the COMSAT satellites I showed you earlier, with the geo-stationary satellites, you have coverage from about 88 degrees north latitude down to Central America; so for all of North America you have current coverage today, via satellite, for \$50 a month. It's pretty cost-effective for most communications needs.

Metrocom has an exciting technology there. Another company out already is doing some really exciting things too, with a little thing like you've seen in the Star Trek movies. It looks very similar to it, in fact. When you are within a localized region of it — it has a range of about 400 feet — it can detect to within 10 feet a person's position, and it has two-way messaging capabilities. So imagine a pager that works on an infrared badge; it's very similar to a pager in size, but can track as well as send two-way messages, voice and data. There are a

number of utility companies that are using it, and the government is using it in a number of sites.

There is also about half a dozen college campuses worldwide that are using it. In Europe particularly, they seem to be leading that badge technology, and since Olivetti is based out of Italy, that makes sense.

So for the technology in the future, we see it growing to uses that would include ranchers, bicyclists, adventurers, people that are ballooning, people that are serving remote wilderness areas, any place that you need to be able to communicate [where you would do it] currently with a cellular phone but may not have a cellular network. It will be accessible by satellite and in many cases is accessible by satellite today.

That will continue to grow, and I think we'll see more uses as people take smaller and smaller computers out into the field, PDAs and eventually wrist radios and hand-helds. We'll see more and more communications, to the point where we will see data communications and voice communications for maybe the wristwatch that Dick Tracy was all about years and years ago. We'll see it happen literally in the next three years; in the next three years the capability with LEO satellites and smaller and smaller technology will be available.

So it's exciting. Wireless technology is an exciting, fast-moving field with the advances that are going on satellite launches over the next 24 months, and especially with the additional licensing of hardware to utilize those communications networks and those satellites. We're going to benefit as consumers to a tremendous degree, both from inexpensive communications, data and voice communications, as well as being able to benefit from the uses of that technology at a lower price than you can make a long distance phone call today.

M: [inaudible]

Larry Bestor: No, none.

M: Is it reliable?

Larry Bestor: It has been. We literally had communications through thunderstorms and lightning storms. We tested in all parts at all different altitudes, and we really don't have any problems with weather.

M: [inaudible]

Larry Bestor: None that we really experienced. Now, I imagine that sunspots and electromagnetic activity could have an influence and an effect on low-orbiting satellites, but until enough get up there — at least 36 satellites — to really produce some effective test results we're not going to know for sure. But at this point in time the GEOs have been performing really well for a long time, and it's a technology that's just being applied to a lower altitude and a wider network of satellites. Hopefully we'll have the same results. Yes.

M: [inaudible]

Larry Bestor: Exactly. A person that comes up with high throughput through a satellite that's inexpensive to build — by Hughes or Rockwell or one of the major satellite manufacturers — will be a very wealthy person, because that is a very valuable technology that does not yet exist. Yes.

M: [inaudible]

Larry Bestor: Throughput right now, inbound, is 14.4 and outbound is 48 baud. For bandwidth — to put that in numbers, in real numbers, the satellites right now handle about 200,000 subscribers, and that would be an average of — well, consumption on that is about 2 million bits of data per hour, so the volume isn't there to handle the kind throughput on the Internet that we would like to see at this time.

Now, in the future it can be [there], but currently it doesn't exist other than for voice and communications and text-type transmissions. In other words, we're [going] to see huge video conferencing going through satellite transmissions, but it's just not real feasible for that capability yet. Yes.

M: [inaudible]

Larry Bestor: There is a similar technology to what you are describing by Rockwell systems. The Rockwell radio that's currently available will switch from a local network, and if that's not available to the radio it will jump to INMARSAT. So it's intelligent enough to do that. That's the only one that exists. But there is no one that I know of that combines cellular and satellite. Cellular is a very expensive option.

M: [inaudible]

Larry Bestor: Yes, and primarily that will be a real advantage for voice and high-volume data transmissions in the future. That's yet to be played out, and I don't think the jury is in yet to decide how well that's going to perform.

There are a couple of companies that have vested stakes in seeing that perform, and there is some tremendous potential available. [With] CD video technology we haven't seen it applied, but certainly in a large volume of video transmissions.

M: [inaudible]

Larry Bestor: Who are the players? Qualcomm and [Loral]. And everybody is familiar with Qualcomm; Qualcomm is CDPD technology. I thought I saw a hand over here.

M: [inaudible]

Larry Bestor: I haven't seen that, so that's a good question, I will have to check that out.

M: And at a tremendous megabyte per second, 2 megabyte per second rate, I think. So it's very, very fast.

Larry Bestor: It relies on the hardware, as I understand it.

M: Well it's not mobile, it requires a repositioning with each physical movement of the receiving [inaudible]. But it could easily be used on a camper or on an RV that moves about and then sits there for a while, long enough to make the repositioning worthwhile.

Larry Bestor: It's very similar to the early satellite TV dishes that we saw on RVs that would pop-up in position for a satellite lock-on, and when they were done they moved it and lowered

the satellite dish. That's quite a bit different. The antenna we're using right now is about this big around, with a whip antenna about that long. It doesn't have to be positioned; it's a non-directional antenna, which is ultimately the best. We'd like to see. The Hughes design sounds like a good one, they just have to get the antenna and the reception down.

All right, thank you for coming. I have nothing else, and since the computer is not going to come back up again you just missed some great pictures.

There is one more thing I'd like to do. We have a... You have it? Okay, I'm just going to run through those real quick.

I'd like to introduce Bill Robinson. I don't know how many are familiar with Telos Corporation. Bill represents Telos Corporation, a licensee of our technology that provides satellite tracking services to the U.S. government on a large scale. Internationally they have been doing it for years. And he will be here to help answer questions you might have after we're finished.

M: [inaudible]

Larry Bestor: And Toshiba still makes a good notebook computer.

M: [inaudible]

Larry Bestor: \$299 [from] Metrocom. They are more expensive in other places. That's the lowest price I've seen.

M: [inaudible]

Larry Bestor: They vary in speed from 9,600 to 28.8. They have more expensive versions for \$599; they have from \$299 to \$599.

Okay, we talked about Metrocom. Why don't you back up a minute there Bill — you know how to [go] backward? I think it's this button here.

M: [inaudible]

Larry Bestor: This isn't connected here... Oh, it is, okay.

[Logitrack] software is the software that we developed for doing that on-line using the GPS satellites, communications satellites and the Internet. So you have the ability to really combine those three technologies, the communications and navigation technologies as well as mapping technology to provide a graphic representation in the Windows environment of the position of the vehicles you're tracking. And that will track you with the accuracy of the GPS received, so if you have a typical C-code GPS unit, that's accurate to about 100 feet.

If you have a differentially corrected GPS unit, that would be accurate to a meter. Metrocom's ricochet wireless radio networks already provide high speed access to the Net.

Here are the service areas that currently exist, and Seattle is late '95. Boston was one of the cities scheduled for late '96, Washington D.C. in early '96, and the areas up above are areas that are already covered by the ricochet service. As you can see they are very localized coverage areas because of the tremendous infrastructure they have to build in those localized areas in order to cover it.

The wireless networks that exist, [the ones that have] currently rolled out the alpha development product list are on this list here: Xerox PARC and DEC — who seem to have some really aggressive technical people that love to have the neatest toys — MIT, Media Lab,

Cambridge and Velcor. All the rest up above are in Europe. That's the Olivetti badge, as I talked about earlier.

What's kind of exciting about that particular technology is that it will transmit that unique infrared signal every ten seconds, so that literally you can identify, from a tracking center like we showed earlier with our [Logitrack] software, exactly where in a building everybody is by their particular ID. It just reads the database and puts in the name or the number of the individual you want to track.

What does the future hold? Shipping fleets, tracking containers — and putting sensors on refrigerated units is a tremendous market in the future. We've had calls from people in the Caribbean, and there is a company that we partnered with call [Caribsat]. All they're going to do is market the technology to cargo container companies, because [those companies] want to be able to monitor, when they're shipping a cargo of bananas from South America to the United States, what the temperature in their refrigerated cargo container unit is.

If the temperature drops by a certain amount an alarm goes off and sends a signal out to the satellite, and that in turn alarms somebody that some preventative correction and maintenance can be done. Otherwise, generally they'll go down in those cargo holds in those ships, and nobody ever checks those cargo containers until they arrive at the port. By then a whole shipment could be lost — hundreds of thousands of dollars of produce. So that's a very important market in the future.

[There are applications for] telecommuting, which we all do, and we'll do more of it in the future. Balloonists I talked about earlier, cyclists — there is a fellow traveling around the country right now, a journalist, fascinating individual, and he has every techno-gadget you can imagine on his bicycle. He just bicycles everywhere, through rain or shine — it's totally enclosed. He has a notebook computer with a navigation system built-in the notebook computer, and could tell where he is and communicate wirelessly with the companies and the wire services.

Ranchers, of course. That's a big one.

Any remote sites — wilderness mappers, surveyors, road warriors.

Urgent search-and-rescue operations can be sped up so lives can be saved.

[There are applications for] remote adventurers and imaging — I can imagine e-mail messages being sent from the next Mount Everest expedition.

For cruisers, people out on a ship, if they want to contact the office or send e-mail back and forth, you can spend more leisure time and still get your work done.

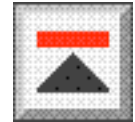
Okay, and watch children. This is a big one — a combination of technology which is a little bit broader use of the Olivetti tabs that are able to identify individuals and certainly will be able to track their whereabouts. We will be able to put them in the clothing of children and be able, from our home computers, to identify where they are at any time.

Another important one: the Dick Tracy wrist radio. I'd say three years, tops, and we'll see those. And, of course, accessible remote databases when you're out on your runs.

My last one is my favorite: transporters. Eventually I think we will be able to see, with the continuation of wireless technology, DNA restructuring and mapping and the transporters that we all saw on Star Trek.

And here is more info on the Web. I'll leave that up there for a while so you can copy those down. Thank you for your attention, that's all.

TUTORIAL INTERNET 101



SPEAKERS

Andrew Kantor

Senior Editor, *Internet World Magazine*

Eric Berlin

Contributing Editor, *Internet World Magazine*

Andrew Kantor: [Let's start by giving you] a general idea about what the Internet is. Well, you have obviously read *Newsweek* and gotten some idea of it, or you have seen *60 Minutes*, so you have an idea that there is this Internet thing out there that is obviously important. But what is it?

Is anyone here not familiar with computers at all? No? Good, that saves us a whole lot of trouble if you know how to use your computer.

So, there is this Internet thing — you want to know what it's all about. You keep hearing about all this wonderful information out there on the Internet. You keep hearing about how everyone is getting connected to the Internet — my company is on the Internet, this company is on the Internet — what does all that mean?

Eric Berlin: What does it mean to be on the Internet? Where is it?

Andrew Kantor: Yeah. You hear terms like “Information Superhighway” and “global computer network,” and it does not mean anything. What does that mean, information superhighway, global computer network? What is that all about?

We are going to try to give you an idea. We are going to give you an idea of exactly what the Internet is so you can walk out on the show floor, and then when you see a company and they say, “We do Web servers,” you'll say, “Oh, I know what that is.” Or if they say, “We provide e-mail software,” you can say, “Oh, I get it.” You will be able to understand what this is all about, and we'll give you a foundation for everything else you need to know for the rest of the show.

We are also — obviously, as you can read — we are going to cover what people do on the Internet and why it is such a big deal.

M: Do you give out handouts?

Andrew Kantor: Do we give out handouts?

Eric Berlin: We gave out handouts. Everybody has one by now, right?

Andrew Kantor: Oh, good. Onward we go. In Part One, as it says, we are going to cover exactly what the Internet is and what is on it. We are going to try to give you a good analogy for what the Internet is.

Imagine that somewhere there is a shoe company. They make shoes, like Florsheim and Dexter and a bunch of others. And they have information on their computers; like most companies nowadays who have computers, they have got a lot of information on their computer. They have their inventory, they have designs for shoes, they have personnel records, all that kind of stuff. That's great, and they use their computer a lot and they keep a lot of information on it.

Let's go back. The shoe company does a lot of business with a leather company for leather shoes. The leather company also has a computer and the leather company also puts lots of information on their computers. They put personnel records, and what cows are being killed this week and what is coming in and what the various companies they deal with are going to need in the next couple of months. They have that kind of information on their computer.

Of course, the people at the shoe company are always in contact with the people at the leather company because they need information. What kind of leathers do you have? Are we going to run short on inventory? Or rather, we are going to need a lot of this and make sure you have that; do you have anything new coming in that maybe we want to make shoes out of? They are always in touch and they are always on the phone with each other.

So one day they come up with a bright idea: why don't we hook our two computers together? The idea is that this way, rather than call you up — we are a 24-hour-a-day shoe manufacturing company — rather than call you up and say, do you have this leather in stock, or what about this or what are you getting in, we can just tap in to your computer from our computer. Computers can do that.

Now, of course, we don't want you to have your secret information, personnel records and stuff available to us. We want just the stuff we need, if you can make that available to us. And we'll put information on our computer and make it available to you at the leather company, so that if you need something from us, if you need to know what quotas we are trying to fill, you will have the leather ready.

In other words, we both have computers, we both use information, we use a lot of the same information, so let's connect our computers together. So they decide [to do it] and they call Sprint or AT&T or MCI or any major communication company and they literally have their two computers wired together across town.

Eric Berlin: Let me draw a picture of that.

Andrew Kantor: Voilà - and it was good. It works really, really well. Great, we can share information, and people at my company can get information from your company. People from your company can get information [from my company]. It's a great idea.

The shoe company says, "this is working so well, now that we can exchange information, that we should do the same thing with a rubber company, the same deal. They have some information that we need, and vice versa." So they again call Sprint, AT&T, Wiltel or whatever, and wire themselves to a rubber company.

Now the shoe company can share information with either one. Everyone following this so far? Good. So now we have the shoe company, the leather company and the rubber company, and they're all wired together. Now, a side benefit of this is that anyone at the rubber company can also get information from the leather company; the same information that is available to the shoe people — why the people at the rubber company would want it, I don't know; in fact, they probably wouldn't, but because they are all connected — well, this works really, really well. So at the shoe company and the rubber company and the leather company, everyone says, "this is a terrific idea hooking up our computers. Let's keep going."

They start hooking up a podiatric college — "hey, tell us the latest orthopedic designs. We want to get information." The rubber company hooks their computer to a tire company, and, of course, the [rubber company] makes toys, so they hook up there. So people are getting the idea of hooking their computers together so they can share information — and, again, not all the information, because the rubber company is not making their personnel records available to the tire company, Goodyear or whoever — but they are making some information available on all their computers in this little town where these six companies are connected.

Everyone catches on to this idea and it expands and expands and expands. Colleges, universities, textbook companies, toy companies, auto repair shops, everybody says, “hey, everyone is calling up Sprint or AT&T or MCI and saying, hook me up to this other guy because they have got information I want.” What is really neat about this is that once everybody is connected like this, someone — say the textbook company — is indirectly, but very much so, connected to this automobile company’s computer.

Now every organization that has connected computers in this little group here has put in only certain information, made only certain information [available] to everyone else. So the textbook company looks at this auto company’s computer and they see stuff that has to do with automobiles. They may or may not use it — maybe they have a textbook on repairing automobiles — but these people can all get information. This is a neat idea.

One point is, who is in charge of all this mess? Nobody, obviously. Originally, the first connection was between the leather company and the shoe company. They were the first ones, but Neil Armstrong is not in charge of the moon just because he was the first guy there. So nobody is in charge. The textbook company pays the phone carrier for this line, and everyone else is kind of just paying their own way. Everyone with me so far?

So, picture this little town with a dozen or so organizations’ computers connected, and that’s exactly what the Internet is. What you saw is, for all intents and purposes, exactly what the Internet is, the difference being that instead of a dozen computers in this fictional town or city that we had there, the Internet is seven million computers in over 100 countries around the world. But it works the same way; there is no central computer. There is no computer in Alexandria, Virginia, that is “The Internet” that somebody runs. There is no Internet, Inc. Nobody is in charge of all this, just as nobody is in charge of that little group of computers in the small town.

Eric Berlin: Because it was something that evolved.

Andrew Kantor: Right. Everyone just started kind of connecting, connecting, connecting and it got bigger and bigger and bigger; and someone who connects in Japan is, by default, also connected to a computer in Boston. It all kind of comes together.

So when someone says there’s something on the Internet, what that means is there is something on one of those seven million computers, something on this little city network — maybe the shoe company or the podiatric college has suggestions for babies, and what kind of shoes babies should wear at what age. They put it on their computer so that people at the shoe company can see it. That is on this network.

Anyone who works for an organization that has a computer on the Internet can put information on their computer. If it is on their computer it is on the Internet, and that’s very important. It is kind of like [saying that] if you have a chainsaw in your basement, there is a chainsaw in your neighborhood. Same thing here; if you have something on your computer and it is connected to the Internet, it is on the Internet. It is a very important concept and the reason I am going over it several times is that it is going to come back a lot later when people talk about things that are on the Internet.

So everybody is in charge of this mess. There is nobody running it at all. The cost is distributed like in the example I was giving — the shoe company pays Sprint, whoever, and the shoe and the leather company pay them to wire their computers together.

Everybody who is on the Internet pays for their own individual connection to the Internet. There is no one running the whole thing. You do not call Internet, Inc., and say, “connect me,” like you would call the phone company. If you want to be connected to the

phone system you have to call NYNEX or whoever, maybe Pacific Bell. You have to call them to hook you up to the phone system.

This does not work that way. The phone system is out there — or in this case, the Internet is out there. You can pay anyone who is willing to connect you to this. You pay your own way. You are not paying a central authority — and this is very, very important.

Distributor responsibility, distributed information. When you put something on your computer, that computer is on the Internet. Therefore, you are responsible for stuff that is on the Internet. If you work at that podiatric college and you put the wrong information about what shoes should be worn by what age babies — well, that is your problem. You put that information — you are responsible for what is on your computer.

You are responsible for what is in your house. If you have a bomb in your house and it goes off and it burns down the neighborhood, you are responsible. Anything that you put on your computer that is on the Internet, you are responsible for the accuracy, the timeliness, etc., etc.

It is very important. Information on the Internet is whatever the people who work for the organizations that make it up want to put there, whatever they feel like making available. That shoe company may want to make some interesting information available about shoe leather and what wears better and what leather is waterproofable; maybe they don't. Whatever they want to make available [they can]. That's very important.

Eric Berlin: And the flip side of that is that if you do not want somebody to display a particular piece of information there is really nothing you can do to stop it, because nobody is running the Internet. There is nobody to complain to. This is why pornography on the Internet is such a hot issue, because there is no central authority.

Andrew Kantor: We are going to be getting more into this a lot later.

Eric Berlin: It is also not a particularly big problem anyway.

Andrew Kantor: This is the picture we need you to have of the Internet, and everything else will just click into place like little points of light. It is an experiment in anarchy. Nobody is in charge. Everyone kind of sticks in their own computers and connects it together and, hey, it works.

Eric Berlin: Just very briefly, this anarchy was created by the United States government. You may wonder who that original shoe company was — it was the government trying to come up with a system that would allow computers to talk to each other in the event of a city being blacked out or a nuclear war or something like that.

Andrew Kantor: Because [the government] knows all these companies, the shoe company and all that together. If the shoe company was not there, the other computers still are and the other computers can still talk to one another. So that was the idea the government wanted to create — a bomb-proof computer network. They created it in 1969.

Eric Berlin: Others saw it was such a wonderful new network, a wonderful new technology, that they built other networks using that same technology in other parts of the country. Then they all started evolving, started connecting to each other in a pell-mell fashion until we have the big mess of the network that we have today.

Andrew Kantor: So the government started it, but the government has very little to do with it anymore. It is one of the many organizations that has computers on the Internet, but the government does not run it, they just came up with the idea for it. Question?

M: You say that no one owns the Internet, but only an Internet provider will let you pay them money to give you access to the Internet.

Andrew Kantor: We will wait and talk about providers in just a little bit.

M: Okay. Will you about what you are paying them for, what they are connecting you to?

Andrew Kantor: All this information on the Internet.

Eric Berlin: All this and more.

Andrew Kantor: Whatever people choose to put there. Yes, the Internet is the precursor to the Information Superhighway. If you are a journalist — I don't know if we have any journalists here, I don't see any press tags — but if you refer to the Internet as the Information Superhighway, that tells me you don't know what you are talking about. Anyone who refers to the Internet as the Information Superhighway is clueless in my book. Al Gore just a few years ago said, "Someday all Americans will be connected to an Information Superhighway, with on-demand news and videos and audio and all that, and that will be a wonderful day."

Well, someday that probably will happen and we are seeing the beginnings of it now, but that is the Information Superhighway, otherwise known as the National Information Infrastructure, NII. It does not yet exist. The Internet is the precursor. This is kind of the idea that it will be built upon, but the Internet is not the Information Superhighway, except if you are in marketing or a PR person and say, "We'll get you on the Information Superhighway."

Eric Berlin: All it is is a catchy catch-phrase.

Andrew Kantor: And it's a kind of an overdone catch-phrase. If any of you ever use [an expression] like "I feel like road kill on the Information Superhighway" or "an on-ramp on the Information Superhighway," I will find you and beat you over the head with this microphone. It's just bad.

In the end, the Internet is just a big bunch of computers. It is just a whole bunch of computers around the world, seven million or so computers around the world that are connected. There is an organization — actually there are several — but in the United States there is an organization in Virginia called the Internet Network Information Center that was originally funded by the government, but is no longer [funded]. Their job is to keep track of who is connected to the Internet and make sure that everyone knows about everybody else that is on the Internet.

"Hey, a shoe company just connected, hey, a college just connected." That's their job, because without them it would get very confusing, so it's good. Right now it's run by, I believe, AT&T and a company called [Merritt]. But it's a good thing.

That's all the Internet is — just a big bunch of computers. And, of course, what's on it? Lots and lots and lots of information. If you can imagine that little network I showed you before, what kind of stuff the shoe company, the leather company, the toy company, etc., puts on — well, now you have got seven million computers, several thousand organizations. They put lots and lots and lots of information, all sorts of different things. NASA is connected; NASA

puts pictures of space shuttle launchers and pictures of planetary probes and whatever they feel like, whatever the people running NASA or JPL or whoever want to put up on their computers that it connects to the Internet.

Some guy may say, "hey, I'm connected to the Internet. I got a computer. My company has a company. I'm going to put a picture of my dog on there because I want to." He puts it on his computer, it is therefore on the Internet. Other people on the Internet, if they can find it, can see it.

Governments put information on the Internet. The U.S. government has plenty of it. If you want to find out the state of a bill in Congress, you can find it because the government puts it on their computer. Their computers are connected to the Internet. It's like a mantra: it's on their computers, their computer is connected to the Internet. That is what information on the Internet is all about.

Which means — and this is, again, back to this important thing — what is on the Internet? What is on these computers? It might be right or wrong. It might be funny, it might be offensive, it might be outdated. It might duplicated. It might not be there at all. It's whatever these people want to put on there.

The Aryan Nation has a computer connected to the Internet, and they will put information on that you may not like. The Christian Coalition, Mothers Against Drunk Driving, any of these organizations can put stuff on that you may or may not like. You may not like this religion, you may not like this philosophy, you may not like these people, you may not like this country, but these people are all putting information on the Internet.

Eric Berlin: We are going to be making a lot of comparisons between the Internet and an on-line service because they are two entirely different things. One of the things that separates them is that an on-line service is in charge of what is on its computer.

Andrew Kantor: An on-line service being CompuServe, America Online, Prodigy.

Eric Berlin: If you want to upload a file to a forum on America Online or Prodigy, there is going to be somebody there to take a look at it first before they make it publicly available.

Andrew Kantor: Somebody is in charge. Somebody owns CompuServe. Somebody owns America Online. Nobody owns the Internet. Imagine if your home computer was connected to the Internet and you could make what is on your computer available to anybody. Well, it's your computer; what do you want to put on it? You could put bad poetry on there. You can put pictures of your dog. You're mad at your ex-wife? Put naked pictures of her on there. Whatever you want, it's your computer — but other people can get it.

Let's say a company has a bunch of computers, [and has] like 50 employees and they all have computers. That company is on the Internet. In general, one computer is on the Internet and then the employees can connect to that one computer very easily. So in some cases, employees can actually — their computers can be on the Internet. It depends on whether the company wants to set it up that way.

At my company, the magazine *Internet World*, we have one central computer. My computer is connected to that central computer, so I can put stuff onto the Internet from my desktop machine if I want to. That is the way my company is set up. Most companies won't do that because they want to have some control over what their employees make available, so they have one computer that represents them.

That is what I mean. There's no control. It is kind of a misnomer to say there's no control over what is on the Internet; what's important is that people are responsible for what

they put up. If you put libelous information on your computer, that is not to say you can do it and then there is no legal recourse about that. That is illegal, and you can be sued for libel because it is on your computer and because you have said this and you have put it up. So no one can tell you what to put up and what not to put up, but the laws still apply.

Child pornography is a big one. If you have child pornography on your computer — it's illegal to own child pornography in the United States. Therefore, you can put it on your computer and no one can prevent you from doing that, because there is no censor checking it, but if you do that you are going to be in trouble just as if you put it in the windows of your house. So if you put libelous information or information that is clearly wrong or illegal on your computer and someone else sees it, you are responsible for it. You are legally responsible for what is on your computer, although there are some interesting questions about [the possibility that] someone else put something on your computer.

Eric Berlin: We are going to be getting back to connectivity in a big way.

Andrew Kantor: When we talk about computers on the Internet, generally they are called "servers" or "hosts." These are fairly large, often UNIX, computers, mainframe computers. They're usually larger, more powerful computers that companies use to connect to the Internet.

Eric Berlin: Then individuals connect to those servers either by dialing in with a telephone and a modem or by connecting via big, fancy wires.

Andrew Kantor: If your computer is on the Internet and you want people to get information from it, you don't want to ever turn it off. You want a big computer that is always on that people in your company and outside your company can get access to.

Eric Berlin: We will go into much more detail than that in a little bit.

M: [inaudible]

Eric Berlin: The U.S. government regulates how phone book companies can distribute their information. NYNEX, the New York Phone Company, is getting around this. They are getting around this by posting their yellow pages on the Web on a server in France.

Andrew Kantor: On the Internet. We will talk about the Web later.

Eric Berlin: Right. On the Internet in a server in France.

Andrew Kantor: U.S. regulation basically says that if you are a telephone company you cannot put information on-line. Or they did say, very recently, that you cannot put information on the Internet. That is U.S. regulations. And NYNEX said, "okay, we will put it on a computer in France."

Eric Berlin: There is no nationwide lottery because the United States government will not allow a nationwide lottery. That might change, But in the meantime that is the fact. This does not effect the country of Liechtenstein.

Andrew Kantor: Liechtenstein has got a government lottery that you, as an American, can buy a ticket to.

Eric Berlin: A worldwide lottery. You can just go and give a credit card number and enter a worldwide lottery.

Andrew Kantor: Gambling is very big.

Eric Berlin: The answer to your question is that there is nothing to stop anybody at this point.

Andrew Kantor: It is the lowest common denominator. The example I give, just because I've been talking about pornography on the Internet, [which is] this horrible problem that doesn't really exist. In the United States you can't have naked pictures of yourself if you are under 18. In most of Europe, it is under 16. So it's kind of like the lowest common denominator; you can get pictures of people in Europe because that is their law.

Gambling companies — it is illegal to do on-line gambling, and there are all sorts of U.S. regulations involving gambling. So these gambling companies said, "Okay, we'll put it on a computer in Belize."

When you are on the Internet you learn how amazingly restrictive the U.S. Government is and how we are living something so far from a free country as — the rest of the world kind of laughs at us. People using the Internet get around regulations of various countries all the time and put information on that they are not allowed to have in the United States. They will put it on a computer somewhere else so the people in the United States can get it.

It is even more interesting when someone in California violates a Tennessee or Alabama law and someone from Tennessee or Alabama sues the company in California because, well, my computer can get to your computer. You have something that violates Tennessee law on your computer, therefore I am going to arrest you for violating Tennessee law in California.

Eric Berlin: There was an adult bulletin board in California which a community in Tennessee felt violated their community standards law, and so they sued on Tennessee grounds.

Andrew Kantor: They arrested him and they won, although it is being appealed. They won the first suit and then I think they lost on appeal.

Eric Berlin: It is really quite a hoot when you think about it.

Andrew Kantor: The laws of the world are going to come down to the lowest common denominator because you can always find some country that will let you put some information up somewhere.

It becomes very interesting. In the United States, if you libel somebody, if someone sues you for libel, they have to prove — you can say, "oh, but the information is true and in the United States truth is a defense for libel." Not so in England, where truth is not a defense. They can say, "no, you still said something bad about somebody." Okay, so you're in England; you want to say something bad about someone? Say it in the United States.

All right, [back to the Internet]. What is on all the computers? All this stuff is on these computers. *Alice in Wonderland*.

Eric Berlin: And then some.

Andrew Kantor: And then some. *Alice in Wonderland* is there because the copyright has expired and someone has taken the time to actually type in or scan in or somehow get into their computers the full text of *Alice in Wonderland*. It is called "Project Gutenberg." They are trying to get every book in the world electronically on the Internet, and they are doing a very good job.

The *CIA World Fact Book*, [which has] all sorts of information about countries around the world. The CIA says, "okay, we can declassify this. We will put that on our computers on the Internet." The Bible [is there] in many, many forms, because they can't find the copyright holder. *Playboy* magazine is there because *Playboy* wants to put in the text. Do you want to find *Playboy* interviews? The best place to find it is on the Internet, because all the interviews are back there and it's a lot easier than going through the library or looking under your mattress.

AT&T has put their 800 directory there. Why? Because someday everybody is going to be on the Internet. Why? So these poor little 800 operators have to answer these phones. Why don't we just make our computers available to the rest of the world through this Internet thing? If I want to look up an 800 number now, and I am on my computer, it is easier to go there than to actually deal with an operator.

Eric Berlin: Along those same lines, FedEx allows you to search by tracking number to see where your package is. You do not need the tracking software that they were advertising a month ago; all you need now is to go onto their site on the Internet.

Andrew Kantor: UPS, Airborne, they are all doing the same thing. They have information on their computers that is for the public. If some of the public can get there directly and not have to deal with the middleman then that is one less person we have to pay.

Pizza Hut lets you buy pizzas through the Internet.

Eric Berlin: As long as you are in San Jose.

Andrew Kantor: Just type in your zip code and they can deliver to you. You can order a pizza through the Internet.

My bio is up there. I have information on the Internet because my company is on the Internet, and I paid someone to put my information up. We will talk about that in a little bit, but I put information about me up on the Internet because I wanted to.

How do you get on the Internet? You need a few things to get on the Internet. The first one is rather obvious, and if you did not know this already you are in the wrong seminar: you need a computer. It can be a PC, it can be a Macintosh. Faster is better. We will go into a little more detail in a moment about what you need.

So you need a computer and you need a modem, the faster the better. A modem is a device, for those of you who do not know, that connects your computer to other computers through a telephone line.

Eric Berlin: This should indicate to you that we are not talking in the seminar about corporate connectivity, how to set up your company on the Internet, etc. — we are simply talking about you, the individual, with your computer and your modem.

Andrew Kantor: Although companies and corporate connectivity is very similar, just on a larger, more expensive scale. Kind of like if you take a cab by yourself, it costs like \$5; if the company pays for it it's \$25. It is the same thing.

You need software to get onto the Internet. It used to be that you didn't, that you could use just about anything out there, any kind of communication software that came with your modem, the cheap stuff. But nowadays, in order to get the most out of the Internet or to get anything real out of the Internet, you need Internet access software. You can buy it, you can get free samplers in the back of books or you can get it from your Internet access provider.

You need an Internet access provider, those companies on that little map I showed you. If you go, say, to the guy at the shoe company, and say, "you have a lot of great information in this little network you have, about the toy company, the colleges. I would like to hook up my home computer to get information from this little network you have." The shoe company is going to say, "you think I am going to waste my time letting you get connected to this? No way." These companies on the Internet have better things to do than to hook you up.

So what has emerged are companies called "Internet access providers." They get themselves hooked up to the Internet the same way these other companies do — Sprint, AT&T, whatever — and they say, "Our business is selling access to other people. We will let you connect to the Internet through our computers. Our computer is on the Internet; you connect to our computer using your Internet software, modem and computer and then you can get access to all the information that is out there. Furthermore, you can also put information on our computer which is on the Internet, so you can put your own information up there." But Internet access providers, or Internet service providers — IAP, ISP — their job is to hook people and organizations and everyone else to the Internet. They are connected already. It's wholesale and retail. "We are connected. We will sell it to you."

Talking about computers... In the old days I would say — like when we gave this seminar a couple of years ago — that any old computer will do. You can use an old IBM XT with a monochrome monitor and you can get on the Internet. You still can, to some extent, except that with much of the Internet now you need graphical software, and better software to access it, so that's no longer exactly true, unless you are willing to learn UNIX.

For those of you who know DOS, UNIX is like DOS but harder and less intuitive, believe it or not. But nowadays you need good software, you need Internet software to get onto the Internet. If you want to learn UNIX we can talk about what are called "shell accounts," where you are typing in UNIX commands to get stuff off the Internet and you are not seeing any pictures. It is still possible; but for normal people, you need a good computer.

There is also all that multimedia stuff. There are lots of pictures and sounds and animation and who knows what, and for that you need a better computer. So if you are going to buy a computer, you can get a PC or a Macintosh, although you will find that a Windows PC is a much, much better computer for accessing the Internet for one reason only, and that is because of the amount of software that is available.

So you can use a PC or a Macintosh, and the faster the better. The newer the better. You want to be able to run Windows or Windows 95 as Windows 95 applications come out. With a Macintosh, you want to be able to run the latest software. There is software now for a PowerMac; you want to get a PowerMac if you can. Again, the faster the better.

If you have a computer now and you are running Windows or you are running System 7 on the Mac, you should be fine and you should be able to get software, so don't run out and buy a new computer. But if you are going to buy a new computer, get the fastest and the best you can because all the new software is going to require faster computers with more memory.

Eric Berlin: It already does. And the applications that are available on the Net are just remarkable, including animation and multimedia. Virtual reality is what we're moving into soon.

Andrew Kantor: Anyway, about buying a modem — this is very simple. Buy the fastest modem you possibly can. Not the fastest you can afford, the fastest that is available.

Eric Berlin: Use your credit cards. You will regret it otherwise. A 28.8 modem is presently the fastest available.

Andrew Kantor: 28.8 modem means... Does anyone not know about modems and modem speed? Modems are rated in speed. The modems that are around now are in bits per second: 2400 bits per second, 14,400 bits per second, 28,800 bits per second. The higher the number the faster the modem. Very simple.

You want a 28.8 modem because that is the fastest you can get. It's also called a V34 modem. If you have a choice between a faster computer and a fast modem, get a fast modem. Spare the PC, spoil the modem. Get the fastest thing you can possibly get. That's the most important thing about your connection and it is worth every cent, just as getting a slower modem will be worth every cent because they're pretty cheap. You can get a 14.4 modem for \$89 or less. You'll probably spend \$150 to \$250 for a 28.8 modem, and it is worth the extra money.

Software is tough. Why is it tough? Because there's so much out there and so many different ways to get it.

Eric Berlin: What people are packaging and putting out on the market are what are known as "Internet suites." They took a program that will let you read your e-mail, a program that will let you look at UseNet News — and you'll see all this soon — programs that will let you use every facet of the Internet. They put it all into a box, along with a dialer that will let you use your modem to connect to the Internet, and they put it on the shelf. Most of these are for Windows. The best ones are *Internet in a Box*, *Internet Anywhere*, and *Internet Suite*.

Andrew Kantor: The commercial software that is out there for the Internet costs anywhere from \$39 to \$150. There are lots of different packages out there and they all do basically the same thing, which is connect you to the Internet. And they let you do the same things on the Internet, which we are going to go into for the rest of the seminar. That's all they do.

Eric Berlin: Here's the thing: Once you're connected to the Internet it doesn't matter what software you use. If you like the mail reader from package A and the news reader from package B, you can do that. There's free software out on the Internet, there's free software that's better than the commercial stuff, basically.

Once you get a dialer and get yourself connected to the Internet, once you learn how to get this terrific e-mail program from this site on the Internet and get this terrific news reader — we'll be telling you the names of these terrific things later on — from this side of the Internet, [you can] set up your own little personnel Internet software suite.

Andrew Kantor: But basically, when you're starting out you want to buy software. It's very easy to set up nowadays, especially since a lot of them come with preconfigured providers; if you use such and such as an Internet provider it's all configured and it's easy to set up. If you don't, it takes a little longer to fiddle with some numbers.

It's very easy to set up and you can mix and match. Buy one suite, and after a couple of weeks of using it you can switch with something else. There's a lot of freeware and shareware software out on the Internet that you can use and that you can substitute. And it's really good stuff.

For Windows, the best product, in my opinion, is *Internet in a Box*. They're all very good. That's the thing, they're all really, really good, like *Internet Anywhere*, formerly by a company called MKS. *Quarterdeck Internet Suite*, [Walagon] *Emissary*... You'll see a lot of these products out on the show floor if you go there. All this stuff is really, really good stuff.

For the Macintosh there's a program, a very old program, called [Versiterm] *Link* which has not been updated in awhile, and there is *Netshark*, which is fairly new from a company called Intercon. That's it. *Netshark* is the only thing out there that's not entirely complete. I don't think it has a news reader; I think it's missing some very important piece of software, but for a Macintosh it's the only commercial product available.

On the good side for the Macintosh is that there's tons and tons of Macintosh software on-line that you can get out on the Internet that you can get copies of.

Eric Berlin: The problem is, though, you have to get on-line before you can get that software.

Andrew Kantor: If you buy Internet books, a lot of books have access software disks in the back of them. That's probably the easiest way. Once you get connected to the Internet, you can create your own little connection of programs.

Eric Berlin: As Andrew said, most of the commercially available software is preconfigured for national Internet access providers. You need an Internet access provider who is basically — it's a big computer out there, and you're going to pay them money and they're going to allow you to connect to their computer and thus to the entire Internet. The major pieces of software are preconfigured for national providers like NETCOM, PSI, and CompuServe. [With CompuServe], besides their on-line service they are also an Internet access provider.

Andrew Kantor: There are a lot of big, national providers out there and even more small, local providers.

Eric Berlin: The thing about the local providers is they tend to be cheaper.

Andrew Kantor: Considerably cheaper.

Eric Berlin: The national providers generally charge an hourly rate, with maybe the first 20 hours free, and then after that it's \$1.50 an hour or something like that. That may be fine for you if 20 hours a month seems like a whole lot of time; [in that case] you might want to go with a national provider. They also provide phone numbers from all around the country.

Andrew Kantor: So if you travel a lot and you want to keep connecting, there's an alternate number you can use, an alternate number in Boston, in New York, in San Jose, in Chicago. You can always find numbers and that's kind of useful if you're doing that.

Eric Berlin: They'll also hold your hand if you need it. They have tech support.

Andrew Kantor: Many local providers have tech support, but not 24 hours and it's not quite as good. Local providers give you much more personal service, where you can talk to Johnny and say, "hey, look, I'm having a problem," and he'll help you out. He knows you by name.

[With the national providers] it's kind of like shopping in a major supermarket; hey, it's really good, but the grocer doesn't know you. The difference, of course, in that analogy is that local providers are usually much less expensive than national providers. National providers have

to pay for a major network they're running, and for all these tech support people, etc. Local providers do not. They are usually a small operation and they're usually, in most cases, very good. I always recommend going with a small local provider rather than a national one.

Eric Berlin: You do have to configure your software. Your software comes preconfigured for a national provider, but you're going to have to do the manual configuring for a local provider. That sounds scary, but it's really not. All the software will ask for the same different chains of numbers; your provider will give you those numbers and all you have to do is fill them into the right blanks. But it is an extra step that you have to take. It can be a little intimidating.

Andrew Kantor: You call the provider. You say, "hi, I'm a local mom-and-pop shop. I've got *Internet in a Box*. I've got *Netshark*. I want you to connect me. What do I do?" They'll say, "okay, on this screen, type this, this, and this." It's really very simple.

With the national providers you look through a list, you start your software, and it asks which provider you want to connect to. Something like *Internet Chameleon* actually gives you a little screen that tells you how much they charge and all this other information, and boom — it does everything for you. It's a one-time advantage because you only have to configure it once, but it's nice. If you're really scared, go with a national provider.

You can always switch. That's another thing. It's the same Internet, so if you use *NETCOM* today you can switch to a local "BostonNet" tomorrow. It doesn't matter, it's the same Internet.

As I was saying, you can always choose another provider. Many providers provide software as well, even local ones. They'll say, "oh, we've got a collection of freeware that we've put on a disk. We'll send it to you and we'll tell you how to hook it up." It's often as good and often better than the stuff that large national companies will give you.

Companies like *NETCOM* are out on the show floor, and they have their own [software]. It's called *NetCruiser*. It's their own software, and it can only work with *NETCOM*. I believe now you can use other software, but at one point you could only use their software with *NETCOM*. They gave you the Internet, but you had to use what they provided you.

Other companies also do that. *PSI* is another big national provider, and they give you their software. So both local and large often will give you what you need.

Let's talk about cost. Just like buying apples varies from store to store, from big chains to little chains to local people to stands on the street, Internet access varies from provider to provider and costs anywhere from \$5 to \$10 a month to \$50 a month, and anywhere from \$0 per hour — it's called a flat rate — to a couple of dollars per hour [for additional time]. You have to shop around.

A nice thing about being in a major city is that there are usually several providers in the area, and you can call them. There are ways of getting lists of providers. In the *Elements* that you've got it tells you how to get a list of providers. You can look through the list and call and ask, how much do you charge, how much do you charge, how much do you charge, and decide what's best for you.

This is important and we always get questions about this. Whatever you pay your provider is your only cost for using the Internet. If you pay your provider \$15 per month plus \$2 an hour, that is your only cost for using the Internet — meaning you can send a million e-mail messages to your friends all over Europe and Asia, you can get information from computers in every continent, you can spend hours and hours a day on it, whatever your provider charges — and that's it [as far as the cost].

If you send e-mail to Japan you're not paying long distance phone charges. If it takes two seconds and your provider charges \$5 an hour — you do the math. You're paying a fraction of

a cent to send a message. Whatever you pay your provider is your only cost for using the Internet.

Now, when you're on the Internet, you may bump into things that say, "if you want to do this, you have to give a credit card number." I mean, they have for-fee services out there and I'm not talking about that, I'm talking about the things we're going to talk about today — using the WorldWide Web, using UseNet News, using e-mail. Whatever you pay your provider is it. And people always say, "but if I'm going to spend an hour on that computer in Sweden, I'm not paying long distance?" No. If you have a flat rate provider like I do, \$35 a month, I can do anything I want and it costs me \$35 a month, period.

It's very important. Also, the cost of the phone call to your provider — hopefully it's a local call and it's like three cents and that's it, but not counting that, that's all you pay. That's very important.

Andrew Kantor: There are so many providers that will charge you extra, but they'll give you an 800-number and they'll bill you \$5 an hour or something like that. CompuServe, I know, does it, and some other companies do, so there are providers that do that.

Eric Berlin: You'll have to do the math, since it turns out you're paying for the 800 service. You'll have to figure out whether that's cheaper than making a long distance call to somewhere.

M: Is it safe to put your credit card number for billing?

Andrew Kantor: Yes, and we're going to talk about that later. We'll talk about security issues. Most of these providers, when you call them, you'll say, "hi, I want to be connected to the Internet. I have this software." They'll say, "okay, here's the information. Here's your name, here's your password. What's your credit card number?" And you rattle off your credit card number. That's fine, you do it over the phone.

Some will let you do it over the Internet itself. Not too many, because they figure you're not on the Internet if you need a provider. But it is very safe to send your credit card number over the Internet. We'll talk about that when we talk about commerce and things like that.

[Let's talk about] on-line service. People say, "I've got America Online, aren't I connected to the Internet?" Well, kind of, but not really. You're also paying through the nose. CompuServe is an odd little exception right now, and the others are going to become odd little exceptions.

First of all, they're not true Internet providers. They are on the Internet and you can use their computer and get the information that they get off the Internet, but they're not really Internet access providers. You're not connected directly to the Internet.

When you connect to the Internet the way we're going to show you we are, you are on the Internet. You are getting information directly from other computers. Your computer is talking to these computers all over the world. If you're using CompuServe, Prodigy, AOL, you're just talking to their computer. It's not a big difference, and their computer is talking to the Internet; it's not a big difference, but it's an important one.

These providers are much, much, much more expensive. America Online, especially, is phenomenally expensive. You get five free hours — for \$10 a month you get five free hours. That's \$2 an hour, and that's not that cheap. Then it's \$2 an hour [additional]. So America Online is \$2 an hour, CompuServe is a little less, Prodigy is also a little less, but you're paying through the nose.

You're paying through the nose because they offer their own stuff. They may offer you software, they offer you tech support, and they offer their own content. If you want to get

Grolier's Encyclopedia you can only find it on CompuServe. If you want to get *TV Guide*, they're not on the Internet right now, you can only get them on Prodigy. These services have their own content, and they've organized that content really well. They've made it really easy to use, and you are paying for that.

If you want to use the content, if you want to have access to the access of Prodigy, America Online and CompuServe, then by all means, pay for it. If you want access directly to the Internet and everything that's out there, which I think is a lot better, then why pay these people for their content? Why pay for something you don't need? It's like buying a car with all sorts of options that you don't really want, but it comes with it. This is the same thing, where this stuff comes with all sorts of information that you probably don't need.

[Tape change]

Andrew Kantor: If you want to access the Internet and you're an America Online subscriber, if you want to access the WorldWide Web, you must use their WorldWide Web software. If you're connected directly to the Internet you can use any of a dozen packages, things like *Netscape* and *Mosaic*, which you might have heard of. You can't use those with America Online or Prodigy.

CompuServe is different because CompuServe now has its own Internet division, so CompuServe will actually give you a true Internet connection as a separate kind of service. You're still paying full CompuServe rates, but it's a direct connection to the Internet and you use your own software. So that's why I said it's kind of a little exception to the rule right now.

Eric Berlin: In time everybody will.

Andrew Kantor: Yes. Prodigy and America Online are both aiming in that direction.

W: [inaudible]

Andrew Kantor: Okay. Her company uses CompuServe. Does that limit her to what she can get on the Internet? No, not exactly. Of course you would pick CompuServe, the tough one to explain. If you have CompuServe, you have whatever CompuServe information manager on your desk. That's what your company uses and you can use all their tools, all their Internet tools — [which is a package called] *Go Internet*. They have a bunch of tools. So you can get the same thing, although you're kind of stuck with their software which isn't all that great. But with CompuServe you can also use regular Internet software. You have to call them up and they'll explain to you how to set it up to use regular Internet software over CompuServe.

If you have America Online, if that's what your company has or that's what you have at home, you can use the Internet. You can do all the things we're going to do, although the software isn't quite as good. So you can do all this stuff because they all have access to the Internet, but it's not as easy with an on-line service as it is when you're directly connected to the Internet. For one thing, you just don't have the choice of software. There's really good Internet software out there, and the on-line services are not quite caught up to the quality of software.

Microsoft Network came out, but first they said, "We're going to replace the Internet. We're going to be bigger than the Internet." I have yet to see the Microsoft Network show. Someday it will be there. Microsoft Network works just like the others, except much smaller; and they offer, again, Internet access to some extent. Use their tools — it's just the same. I

don't mention it because they're so small. There's also Genie and Delphi; there are other on-line services besides the Big Three.

Eric Berlin: Let's not forget eWorld.

Andrew Kantor: I'm sorry, [there's also] Apple's eWorld. They all offer Internet connectivity using their tools, so they're all doing basically the same thing. Whatever I just said applies to all of these services, and there are a lot of them.

Small local bulletin boards also apply the same way.

Eric Berlin: At this point I'd like to take a five-minute coffee break. We do have our dial-up connection and we want to test it before the dial-up man leaves.

Andrew Kantor: When we come back we're going to talk more about connecting to the Internet and what tools are available. We're going to explain what people are doing on the Internet — electronic mail, UseNet News and the WorldWide Web. We'll be back in about five or ten minutes.

[Coffee break]

Andrew Kantor: [Let's talk more about Internet access providers]. Service is what generally differentiates them, service and price. What are the prices? Do they have different pricing plans? Will they help you get set up? Will they offer to put your information on the Internet? How much do they charge to put your information up there? They used to be called "Internet access providers." Now they do all this other stuff and they've become "Internet service providers," and that's really the difference.

M: [inaudible]

Andrew Kantor: Is the *New York Times* only on America Online? No, they have information on the Internet also. They have an eight-page edition, including the crossword puzzle, with the headlines and major stories that are out on the Internet. Right now they have a deal with America Online, but that's probably going to change because they have to pay America Online to be there. Why should they bother paying them when you can just put a computer on the Internet? And it's a lot less expensive.

Eric Berlin: It's all going to change. The on-line service structure is going to start crumbling because it's cheaper and because you reach more people by going onto the Internet instead.

Andrew Kantor: It's cheaper for a company to put information on the Internet, and cheaper for people to access the Internet than the on-line services.

Eric Berlin: How about we begin? Are there any other questions on connectivity? We did kind of go over that a little quickly.

Andrew Kantor: Everyone have this general picture of the Internet? It's this big bunch of computers, each computer has a bunch of different people who use it, each computer has a bunch of different information these people have put on it, and there are computers out there that you can use to call Internet access providers to connect and get information and stuff from

these other computers. And that's what we're about to talk about, how to do that. But it's just this big bunch of computers, and it's important.

Eric Berlin: [Let's] move on. People basically do two things, and only two things, on the Internet: they talk to each other and they find information. They communicate and they go out and find some piece of information that they want and retrieve it to their own computer. That's pretty much it. These break down into several other things, of course, but that is the sum total of what you can do on the Internet: communicate and find information.

Communication breaks down into three things: electronic mail, or e-mail — do all of you have e-mail in your offices? How many people here use e-mail in some way on a daily basis?

Andrew Kantor: How many people don't? Okay, good. At least a few of you.

Eric Berlin: So we'll go over that, and UseNet News, which is the giant bulletin board of the Internet, and Internet Relay Chat, which is a kind of fun little diversion that we'll just briefly tell you about.

We'll start off with e-mail, which is easily the most popular form of communication on the Internet. Everybody on the Internet has an e-mail address, and every e-mail address follows the exact same format.

Andrew Kantor: Let's talk about e-mail addresses first.

Eric Berlin: Going back to this diagram for a second, imagine now that every single one of these places — the computer at these places — has a name.

Andrew Kantor: This isn't the textbook company's computer. I mean, they may call it that or they may call it "Orville" for all I know, but in terms of the Internet it has a specific name that other computers that are connected can recognize.

Eric Berlin: So shoes becomes shoes.com. A college becomes college.edu. Every computer on the Internet has a name. Every access provider also has a name. I connect to an access provider called PANIX, a commercial access provider, and therefore the name of their computer is panix.com — C-O-M, which stands for a commercial site on the Internet.

Andrew Kantor: Anything with a ".com" means it's a company, it's a corporation, like the shoe company or the leather company. E-D-U means — well, you can figure this much out. There's also G-O-V for government computers and M-I-L for military computers.

Eric Berlin: O-R-G is for non-profit organizations.

Andrew Kantor: O-R-G, right. Computers outside the United States end in their country code, so computers in the United Kingdom end in UK. IL is for Israel, ES for Spain, etc. LI is for Liechtenstein.

The second part is determined — the .com or .edu or whatever — is determined by what kind of organization you are. If you're a commercial organization you're going to be .com. The first part is the people, and the company decides; as long as no one else is using shoes.com, the people at the shoe company can call their computer shoes.com. I mentioned the Internet Network Information Center, the InterNIC. They're in charge of making sure that there's no conflict of addresses so things don't get confused.

Eric Berlin: Technical things you don't have to remember. This is called a "domain name."

Andrew Kantor: Yes, domain name. Now, there's always a big flap about domain names. It's always good to have a good domain name. The good ones are all gone already, pretty much. My company, *Internet World*, is iw.com. It's very hard to get a two-letter domain name because they're so popular, because they're so easy. The Princeton Review, the SAT preparation company, registered one of their computers as kaplan.com. Well, needless to say, their competitor, Stanley Kaplan, was a little upset that the Princeton Review had taken this name that they really wanted, and there was a whole legal flap about it. But things like that do happen.

Eric Berlin: The InterNIC says you must have the legal right to use a domain name before they will assign it to you, but once upon a time you could register any domain name you wanted. For a brief period of time people were registering domain names left and right — at&t.com, mcdonalds.com, pepsi.com — in hopes of selling that domain name for big bucks to the actual companies.

Andrew Kantor: It worked at least once, for the kid who registered mcdonalds.com. I don't know if his name was McDonald or not, but he got mcdonalds.com and McDonalds tried to sue him and take it away and they couldn't, and they ended up paying him an undisclosed sum to have mcdonalds.com instead of mcd.com.

Anyway, all these computers have names, called domains. All these computers have names. That's what I want to tell you.

Now we're going to talk about e-mail addresses.

Eric Berlin: I get service from an Internet access provider, and their computer is called PANIX — panix.com. This is no longer the first example, however.

Andrew Kantor: Sorry, I changed this. Incidentally, I've taken your name off. Why don't we go back to mine? My company is *Internet World*. As I said, my company computer's name is iw.com. My house at home, where I live, is 676 Monroe Turnpike. That is the name of the house; iw.com is the name of my computer. You write to me at Andrew Kantor, 676 Monroe Turnpike, or you write to me at ak@iw.com. The first part is my name, the second part is the name of the computer where I am.

Eric Berlin: Just as there can't be a second computer called iw.com, there cannot be a second person with an e-mail address that's ak@iw.com. Imagine if you lived in a place where everyone in your family was named George, like George Foreman. Well, who does it go to in that house? It's the same thing. To avoid confusion, there's only one ak@iw.com.

Sometimes computer names are a little longer; at panix.com the company may have several computers hooked together. There's mail_panix.com and info@panix.com, [which are] different computers.

Eric gets his mail at eric@mail.panix.com, so that's where you can write to him. Actually, you can also write to him at eric@panix.com. All e-mail addresses have the "@" sign in them. So his address is a little bit longer than mine might be.

My friend, Tanya, who is out on the show floor someplace, used to be at Emory University. She had this monster address: emoryl.edu. Well, the computer center has their own computers, and there's a specific UNIX computer within it, and that's where she got her mail, so she was tmazaro@emoryl.edu. So names can be longer.

M: What does PANIX stand for?

Andrew Kantor: Public Access UNIX.

Eric Berlin: Aren't you glad you asked?

Andrew Kantor: Your life is enriched by that little tidbit of information.

Eric Berlin: Please also notice the dots in the e-mail address that separate words. There cannot be spaces in an e-mail address; you might sometimes see an underscore thing, but you cannot have spaces in the e-mail address.

Andrew Kantor: They're also always lower case. People can write them in upper case, it really doesn't matter, but traditionally Internet e-mail addresses are always all lowercase.

Sometimes they're even longer, like my old boss at *PC Magazine*. This was her address: gschaefer%editorial%pcmag@mci_mail.com. If you ask someone their mailing address and you say, "I want to send you something, what's your mailing address?" And they say, "my address is 123 Main Street, Suite 16, Cube 14, Mail Stop 8..." I mean, you write it all down, and it's kind of annoying, but you trust them. That's their postal mail address. [This is the] same thing; some e-mail addresses are longer, some are shorter. They all usually go to the right place.

W: [inaudible]

Andrew Kantor: The question is, who makes sure that no one else has these domain names? The InterNIC does. In other words, you can call your computer anything you want, but the InterNIC will register it and tell all the other computers on the Internet that you are jane.com. So you can call yourself jane.com, but if someone else has it you're never going to get any messages and information won't get to you. There's a whole registration process you have to go through.

The most famous e-mail address is president@whitehouse.gov. That is Bill Clinton's e-mail address. It is for real; you can write to him, or rather to Steven something...

Eric Berlin: Steven Horn, I think his name is.

Andrew Kantor: Steven Horn. He's the guy who actually answers the President's e-mail.

Eric Berlin: When you write to the e-mail [address], you get an automatic response back, "Hi, we've read your e-mail — yeah, right — and if it's important, we'll pass it on to the President himself."

Andrew Kantor: Thank you for your question about the deficit. The president will write to you soon.

Eric Berlin: If the president does write back, he doesn't do it by e-mail actually, he does it by "snail-mail," as we call it.

Andrew Kantor: But he does write back, because I came home and found a letter waiting for me one day from the Department of Justice, which scared the heck out of me. It was just a

response — “you wrote an inquiry to the President...” and they responded. So it was kind of weird; they do write back. It’s just as effective as writing a paper letter. I mean, it gets in a pile and maybe he answers it.

Eric Berlin: E-mail is basically the same thing as postal mail except you don’t have to run it down to the corner mailbox and wait three days; you just basically — as you’ll see soon — press “send,” and three seconds later it will be in the recipient’s mailbox. By the way, it’s free. Once you’re connected to the Internet you can send as much e-mail as you want to as many places as you want. It’s not more expensive to send it overseas, and it’s not expensive to send files. We’ll be showing you how to send files.

Andrew Kantor: CompuServe and Prodigy at one point did charge per e-mail message and per size, and MCI nailed it as well, but those are gone now. Those are the old days — that is, 1994. Things move quickly; if you blink you might miss something.

Eric Berlin: You just basically plug in the right address, put in your message and you click on “send.” We’ll show you this in a moment.

Andrew Kantor: You, as an individual, can register a domain name, but you have to tell the InterNIC not only what name you want, but what computer. So I can register kantor.com and I have to tell the InterNIC that anything that’s destined for kantor.com should come to this computer. Now, that computer I send it to can be my Internet access provider, and many access providers will say, “oh, we’re panix.com, but if you want to be kantor.com, for \$20 a month we will handle mail to kantor.com.”

So I tell the InterNIC, “Hi, I’m Andrew Kantor, I’m registering kantor.com, and panix.com in New York will be handling my e-mail. Set me up.” From then on, that’s all it takes. The InterNIC tells the rest of the Internet, over the course of a couple of days, that anything to kantor.com comes to me.

For instance, in my company we’ve registered a whole bunch of domain names for various reasons: iw.com, mecklermedia.com, webweek.com, bigcorp.com. You can write to me at ak@bigcorp.com because whenever I write, I always give an example, bigcorp.com, and people were writing and complaining that they weren’t getting anything. So now you can write there. So you can register these and then you have to find a provider and say, “we’ve registered these, handle this for us.” You talk to an Internet access provider and then you can use those domain names.

Eric Berlin: We’re in a period now where people are going bananas with extreme domain names. Holiday Inn registered holidayinn.com and holiday-inn.com, and some other things. Just holiday.com, I believe they got, too.

Andrew Kantor: Every product, any name. Velveeta.com — every Kraft product you can name is a domain name owned by Kraft. They went nuts; they registered everything. Now it costs, I think, \$100 for two years for a first-time registration. It used to be free, but it got a little much for them to handle, so it’s \$50 a year and you have to pay for two years.

M: [inaudible]

Andrew Kantor: There is an address, and they are on the Internet. There’s a 619 phone number, so if you want you can call information in 619 and ask for the Internet Network

Information Center. I don't remember the number anymore. But they don't like phone calls, because they get calls like "how do I advertise on the Internet?" They get all those calls at the InterNIC. I know because I get them, too.

M: [inaudible]

Andrew Kantor: InterNIC. Internet Network Information Center.

Eric Berlin: Getting back to e-mail here... You can send to several people as easily as you can send to one just by plugging in as many e-mail addresses as you want.

And finally, the last and most wonderful use of the e-mail is that you can join a mailing list, which is akin to a magazine subscription. Basically, when you subscribe to a mailing list you're getting in on an ongoing discussion on a topic, like the gardening lists that some people run.

Andrew Kantor: You essentially write to the person who runs this list — and we'll tell you how to find him — but you write to the person and say, "I want to be on this list," and they say, "Okay." That's all there is to it.

Eric Berlin: Then as soon as somebody sends a message to that list, everybody who is on that list will get it. Then you can un-subscribe from that list later on.

Andrew Kantor: If you send a message to the list, then the 500 other people who are subscribers also get that message. It's kind of an automatic re-mailer.

Eric Berlin: Let's show *Eudora*.

Andrew Kantor: That little blue dot in the right corner means it's time to show you *Eudora*. The e-mail program that we're using is called *Eudora*. There's a freeware version on the Internet, as well as a commercial version sold by a company called QualCom. *Eudora* is — and I've tested them all — the best e-mail program out there. They have a Macintosh and Windows version. They're wonderful.

Eric Berlin: This is all my old e-mail.

Andrew Kantor: If you look on the top, it says, "Eudora In." This is his in-box and these are all the messages he has received. This is who it's from, and we see the names: Dan Berlin, his brother, Lisa, and there's me. [We also see] when it was originally sent, the time and date, how long the message is and the subject. The big difference between Internet e-mail and postal mail is that postal mail does not have a subject, so the envelope does not read "major bill" or "annoying advertisement."

Eric Berlin: I use e-mail quite a bit. It's so much more convenient, sometimes even more convenient than the telephone. I communicated with my brother, who is here in Boston, and we had to e-mail back and forth to each other as to how we are possibly going to meet.

Andrew Kantor: If you're staying at a hotel, you know how expensive it is to make calls from your hotel room. So why do that when you can just do e-mail?

Eric Berlin: Andrew lives in Connecticut and I live in New York City, and together we write a column for *Internet World* magazine. We see each other about once every six months or so, but we are constantly e-mailing the column back and forth, trading ideas, sending each other ideas and putting the column together each month. This is all happening over e-mail.

Andrew Kantor: Let's demonstrate.

Eric Berlin: Let's send just a plain old message.

Andrew Kantor: Click on "New Message." Well, it's pretty obvious that it's already from Eric and the computer knows him.

Eric Berlin: Send it to you.

Andrew Kantor: Okay.

Eric Berlin: Actually, just one other thing; I've set up some nicknames or aliases in *Eudora* and I don't even have to put in ak@iw.com. If I simply put in AK, *Eudora* knows who I'm talking about and will send it immediately.

Andrew Kantor: It's just a little shortcut.

Eric Berlin: It's a very good thing for an e-mail program to have since not everybody has such a wonderful e-mail address as he has.

Andrew Kantor: Let's move on. He gives it a subject. Then he can send copies to other people, and he can attach a file so he can say, "here is this great game I've got."

Eric Berlin: I can send a file simply by choosing the right thing.

Andrew Kantor: Attach a document.

Eric Berlin: It will call up my file manager and ask me, "okay, what do you want to send?" And it's all transparent. It will do its encoding, it will send it out over the Internet, and his mail reader will decode it. It's all transparent.

Andrew Kantor: You notice the signature up there? That's a file that Eric has created that is tacked on to the end of every message he sends. It probably says something like, "Eric Berlin, freelance writer and playwright," or something like that.

Eric Berlin: Actually, I haven't created it, but I could if I wanted to.

Andrew Kantor: Right. And it will be attached automatically to the end of it. He clicks "Send" and — we were disconnected from the Internet, so what it's doing is it's automatically dialing the Internet again. It says, "Oh, you're not connected. I'm going to dial your access provider."

Eric Berlin: And... It's busy. Let's take your questions.

M: I have a question about attaching. I'm having trouble trying to send attachments over the Internet.

Andrew Kantor: Who connects you to the Internet?

M: I don't know. I work for Lotus, so... [inaudible]

Andrew Kantor: When you send a file it has to be attached to a message in a certain way. There are three major "computer-eze" schemes for attaching a binary file — a program, a picture, whatever — or a word processing document to a message. They are called — this isn't that important — Mime, Binhex and UUEncoding. Most e-mail programs nowadays support all of these. *Eudora* supports Mime, Binhex and UUEncoding, but some do not. So if you use Mime to attach your message and you send it to someone who's on a Macintosh, many Macintosh programs do not read Mime, they read Binhex and they'll just get gibberish. So at my company we always use Binhex because more people use Binhex, but Mime is better.

Did we connect?

Eric Berlin: Yes. It's contacting now.

Andrew Kantor: Here we go, and we're watching the progress of the message. You don't have to see that. I'll have it in about five seconds; it goes from this computer to Eric's provider in New York and then to my provider, my company in Connecticut, and if I check it from my hotel room later it comes to me. Boom — just a matter of seconds.

I've never had messages lost; it's very tough to lose messages. It happens as rarely as postal mail gets lost, which is once in awhile, and you hear about this probably less rarely. The Internet is designed to withstand a nuclear war; the post office is designed to withstand a postal workers strike, which is more severe.

M: [inaudible]

Andrew Kantor: If there's something wrong with my address, if he sends it to, [for example], andrewkant@iw.com, it will bounce back and it will say there is no one by that name at iw.com. It's gone from the network and he'll get a message back saying that it could not be delivered.

Eric Berlin: If there's something wrong with the iw.com computer, that message will wait in the next computer on down the line and wait for that computer to come back up, and then it will send it through.

Andrew Kantor: It travels from his computer along to mine.

Eric Berlin: It's a remarkable little system.

M: Are domain names unique [inaudible]?

Andrew Kantor: Absolutely unique. There is only one panix.com on the Internet.

There can be Erics all over the place. There can be millions of Erics. He's eric@panix.com and eric@iw.com. That's the basics of e-mail.

M: [inaudible]

Andrew Kantor: That's a function of the software, whether you get copies of the messages you send. Eudora can save copies. Most packages will ask if you want to save a copy in an outbox; that's just a function of the software.

M: [inaudible]

Andrew Kantor: Yes. I have hundreds of folders, and you can categorize it. But again, that's not an Internet thing, that's a software thing. Some programs do more than others.

Eric Berlin: Here are all my mailboxes here. Every mail message I get in — in theory, obviously — I put into the correct mailbox for later digestion.

M: [inaudible]

Andrew Kantor: How many characters can you have in your domain? That's a very good question. Some computers can't handle some [longer names]. In general, I think 16 is the limit, although some can handle 32 and supposedly 64. I've never seen — longer names are bad because people cannot remember them. My company has worldwideweek.com. I mean, no one is going to bother typing all that in, so I think 16 is the limit you should keep in mind.

M: Can they contain numbers?

Andrew Kantor: It can be anything you want. A company has — micro0ft.com is out there. So you can have numbers and letters if you want, [like] century21.com.

Eric Berlin: We must move on.

Andrew Kantor: Unless you don't want lunch. Questions? How do you get someone's address? Well, how do you get someone's phone number? You ask them. How do you get someone's postal address? You ask them. I can get someone's phone number by calling information, you might say; can't I do that on the Internet? No.

If you meet somebody on an airplane, if you're traveling from New York to Los Angeles and you know his name is John Smith or Mary Doe and you get off the plane and think, "Oh, wow, I want to give her a call," or "I want to give him a call," you think "Well, I'll just look up Mary Doe. I'll just call information." Well, what city?

Same thing with the Internet. There are seven million computers out there, and, let's say 5,000 companies that provide Internet access, just to give a real low number. Which one of those 5,000 are you going to look for this person? Which of those seven million computers is used by this person you met?

The only way to get e-mail addresses is to ask them, to look on their business cards to see if they advertise it, the same way you get someone's phone number. How do you get IBM's phone number? Well, you'll read an ad or you'll see something in a magazine. Same thing with e-mail addresses; it's really no different.

Unsolicited e-mail happens. People say, "Oh, you're a member of the gardening mailing list, and I sell bulbs so I'm going to send you mail advertising this." Does this happen? Yes. Do people like it? No. What are the consequences? Well, chances are that people won't buy your bulbs, and they can do nasty things and complain to your Internet provider. It's generally a no-no. It violates Internet etiquette, or "netiquette."

Eric Berlin: There are other ways to advertise, and we will be talking about that.

Andrew Kantor: There are proper ways to advertise and improper ways to advertise; but there's also unsolicited e-mail. I get tons of it just because of who I am and who I work for, but it is unsolicited e-mail. You'll probably get it once you start getting e-mail, [where you'll get things like] "I noticed you're a CompuServe subscriber," or "I notice you're on the Internet and wouldn't you like blah, blah, blah..." It happens.

Can someone read your e-mail? Well, your e-mail is going from place to place. It's going from your computer, to let's say, Los Angeles, and stopping at a bunch of computers along as it makes its way to Los Angeles. Can someone read it? Yes it can, just as somebody can tap into your telephone calls as your phone conversation makes its way across. You need to be a hacker to do it, for one, but let's say, yes, someone can intercept your e-mail and read it along the way. The government does this all the time. Many national security agencies routinely scan e-mail messages for certain things like terrorists or bombs or something like that.

Is it illegal? They're the government. They decide what's legal and illegal

Eric Berlin: In general, it is, yes.

Andrew Kantor: In general, it's not legal for them to do, it's illegal. They can't use it against you in court, necessarily; but that's another story. Can someone illegally tap in? Yes. If I'm a hacker and I'm on a computer somewhere between here and Los Angeles and I tap in, yes, I can get your e-mail.

What do you do about it? Well, you can encrypt your messages. There is software out there that lets you encode your message so only the person you intend to get it can get it and read it. The most popular and best one is called *PGP*, for "pretty good privacy." It's so good that the U.S. government tried to ban it because they couldn't crack it. That was a year ago; they probably still can't.

If Eric and I both have *PGP* we exchange, in person or somehow, what are called our "keys," and then when I want to write a message I can say to *PGP*, "encode this message so only Eric can read it." Then I send it to Eric and it asks for his password or pass phrase and it decodes it. So I can encode a message so only Eric can read it. We both have to have *PGP*, and it knows — you can intercept it — but it knows you're not Eric. You don't have his password, therefore you cannot read it. It's only encoded for him. So *PGP* is the way that many, many people encode messages if they want to keep it secret.

The other thing is, well, just like you wouldn't send a postcard with your credit card number, don't e-mail your credit card number without encrypting it. If I'm ordering flowers for my girlfriend, I know not to do it on the cordless phone because I hear other people's conversations on my cordless phone all the time. If I'm on that phone I wait until I can pick up a regular land-line phone before I do that.

Same thing with e-mail. It's possible, but it's fairly rare; in fact, I'd say it's very rare that anything comes of it, but yeah, technically, it's possible.

Eric Berlin: Let's move on to UseNet News. Imagine a supermarket in a small town; near the cash register in that supermarket is a big bulletin board divided up into eight or ten topics — baby-sitting, home repair, cars for sale, etc.

Andrew Kantor: You've all seen in the supermarkets where you can pick up the little cards and write baby-sitting and so forth. Imagine it's a corkboard instead.

Eric Berlin: So you come by, and you have a car for sale, so you take the little slip of paper that they provide and you write on it: "I'm selling a car. It's a Honda, call me at this number." You pop it up under "Cars For Sale," the correct category. Other people come to that supermarket and see that message.

Andrew Kantor: They're interested in cars, so they look in the car section.

Eric Berlin: They take a piece of paper and have something to say back to you. "How many miles does your car have?" writes one person, and they tack it up underneath your message. Another person comes by and says, "In what kind of condition is it? Is it okay? Are there dents?" And he tacks it up underneath that [other person's] message. You come back and you see your original message, and you see the messages that people have left. You are having a conversation across time. It's not real-time; people are leaving messages for each other.

The Internet has a similar system. There's your supermarket bulletin board.

Andrew Kantor: Imagine that you're walking through the supermarket and you're interested in furniture. You look at the furniture section of the supermarket bulletin board and you might see one message saying "For Sale," and you might see a little conversation going as people tack messages underneath the others.

Eric Berlin: I think you guys got the concept. The Internet has a system pretty much like that; but rather than eight or ten, there's something like 15,000 to 16,000 different topics going on.

Andrew Kantor: Imagine that supermarket bulletin board with 16,000 sections.

Eric Berlin: Obviously, nobody reads them all — you'd have to be a complete lunatic. So people subscribe to those newsgroups — that's what they're called — that interest them the most.

Andrew Kantor: Which is the equivalent of every day going to the supermarket and looking on the bulletin boards that interest you a lot. There's a thing about pet care; if you're interested in pet care you always go to the pet care section of the board to read it every day. That's what subscribing to a newsgroup is. It's telling your UseNet News software — we have e-mail software, we have UseNet News software — telling your UseNet News software, "every day, every time I check, tell me if there are any new messages in this section in this bulletin in this newsgroup."

You can also post a message, just like you could tack a note up to the corkboard of the supermarket. You can tell your computer, "Post this following message into the cats newsgroup, because I want to know about cats." So your message says, "I just got my first Siamese cat and he's wonderful," and you want you to put this up in the cats newsgroup.

Once it's up there, within a few minutes anybody else can read this message. Anybody else can come by who is interested in cats, just like anyone could walk by the supermarket and look at the cats board, or anyone else can say to their news reader, "Show me what messages are in the cats newsgroup. Oh, there's one from Andrew Kantor about his Siamese cat."

Eric Berlin: This, more than anything, is the Internet's interactive community. The WorldWide Web, which you've heard a lot about, which we will be discussing in great detail later, is the place to get a lot of information. But for the place to have discussions and arguments and debates and nice chats and whatever, this is the place, at UseNet News.

M: [inaudible]

Eric Berlin: What software do you need? Good question.

Andrew Kantor: We'll get to that in a second.

Eric Berlin: Every Internet suite, every Internet software that you buy will have a news reader in it.

Andrew Kantor: Or there are news readers available on-line, just like e-mail software. It comes with the package or you can get your own.

Eric Berlin: UseNet newsgroups — just like e-mail addresses, you'll see that these UseNet News groups are divided into hierarchies. They look a little bit like e-mail addresses, except there's no @ sign.

Andrew Kantor: Instead of baby-sitting and cars for sale, UseNet News has its own little language for naming these newsgroups.

Eric Berlin: Since there are 16,000 of them there has to be a way of dividing them up, so there are hierarchies. There's the "alt" hierarchy, which is a whole bunch of different newsgroups that don't seem to be pertinent anywhere else.

Andrew Kantor: This newsgroup might be called alt.fan.dave.barry. It's an alternative newsgroup for fans of Dave Barry, the humor columnist.

Eric Berlin: Just by glancing at it you could pretty much tell what it's all about.

Andrew Kantor: For instance comp.games.ibm.pc.action. That's a computer newsgroup for IBM PC action games.

Eric Berlin: You go on there and you ask questions. You get answers to those questions, and you ask about those answers, and you have discussions.

Andrew Kantor: Let's show them.

Eric Berlin: Let's do that.

Andrew Kantor: This is what UseNet News looks like. Eric is using a product called *Free Agent*, made by a company called Forte. It's a freeware, UseNet News software that's out there. He can just as easily use the software that comes with *Internet in a Box* or *Netshark* or whatever, but he's using *Free Agent*.

Eric Berlin: Here is a list of every single newsgroup. Now, there are 16,000 newsgroups out there, but remember that I get my access through a company called PANIX. PANIX does not necessarily get every single one of those 16,000 newsgroups. They get a great percentage of them, but there might be one or two frivolous ones that they don't think any of their users are

going to need, so they just don't bother with it. If I wanted it I could ask for it, but they get a large percentage of those newsgroups. Of those, I can subscribe to a subset.

Andrew Kantor: So this is the list that PANIX provides, all the newsgroups that are available; in other words, these will be bulletin boards at his local supermarket. Well, that's not entirely true because these are the newsgroups that he has access to, and all these users go to the entire Internet.

Eric Berlin: So the "alt" hierarchy is huge and weird.

Andrew Kantor: alt.fan.unabomber.

Eric Berlin: alt.fan.barney.dinosaur.die.die.die is in here.

Andrew Kantor: Let's get out of alt. for a little bit. So we're going to look at a newsgroup and we're going to say to our news reader software, "go onto the Internet and tell us what new messages are in the newsgroup called alt.home.repair." Control-F will let you search. alt.home.repair.

Eric Berlin: I subscribe to it. I can either click this button...

Andrew Kantor: Different news reader software use different ways of subscribing.

Eric Berlin: And now I can just go to — I don't have to look at this list all the time — I can go to my subscribed newsgroups.

Andrew Kantor: He's into games, puzzles, New York City singles — if you're not married.

Eric Berlin: So these are the things I subscribe to. I'm just going to get the messages at this moment; I'm just going to get the messages that are in alt.home.repair. Every message has a header that tells you what that message is about. So I'm going to go get the headers that are in that.

Andrew Kantor: The header is the same as a subject of an e-mail message.

Eric Berlin: You'll see that in just a moment. There are 354, so let's all have a little conversation while we wait.

Andrew Kantor: The problem is that we have a modem connection; if you're using, as most normal people do, a modem connection to the Internet, it's not going to be the fastest thing in the world. Unfortunately, that's what we had this guy hook up quickly before.

Modem connections, even 28.8 modem connections, are not the fastest thing around. It takes time, especially when you get to the Web where it takes time to load pictures and things like that. Hopefully we'll have the fast connection running.

Eric Berlin: It's running.

Andrew Kantor: Good. The speed of the connection will be the slowest thing between where you're getting this information and where you are. Often, in most cases, that slowest thing is

your modem because the Internet is fairly high-speed. It uses high-speed communications lines, it uses fiber-optics, it uses satellites; the bottleneck is almost always your modem. So that's why we say the faster the modem the better.

M: [inaudible]

Andrew Kantor: No. Rarely does that happen, because usually it gets to you quickly. The service provider at PANIX can be very busy, and thus take [a long time] to actually send it to him, but in general, once they start, it's not on that end.

M: What does "alt" stand for?

Eric Berlin: Alternative. "Rec" stands for recreation. These are the large hierarchies, alt for alternatives, rec for recreation, soc for social.

Andrew Kantor: PANIX has its own newsgroups.

M: [inaudible]

Andrew Kantor: Is there a code to use if you don't know what the meaning is?

Eric Berlin: Well, there are only so many of them. I mean, you'll see, like...

Andrew Kantor: 16,000 newsgroups. Well, you have to look at the names: [for example], alt.journalism.students — you can kind of figure out what that is; alt.ketchup; alt.jub.jub, I'm not so sure what that is.

But if you're looking for a newsgroup about architecture you can search this list for the word architecture; for instance, alt.landscape.architecture is right there. Generally, the name of the newsgroup tells you what it's about.

Eric Berlin: I can search with the keyword on this list and try to get somewhere.

In the second half of the tutorial we're going to be further demonstrating how to find specific pieces of information, and we're going to let you in on a couple more tricks; but for right now we just want to give the basic demonstration. So, back to alt.home.repair... This is the article list. This is what people are discussing in alt.home.repair right now. Here you can see when things were posted. It's all put together in chronological order here.

Andrew Kantor: Click on the word "Status," up there. These are messages people have posted, just like tacking up messages in the supermarket.

Eric Berlin: Here we see a number; that means that there are seven responses to this message that says "glowing light bulbs," whatever that means. I'm scrolling all the way down to the bottom. There are the more recent messages.

Andrew Kantor: Here, "warped door." So David Stevenson wrote a message called "warped door" and he wrote: "Does anyone have suggestions on how to straighten a warped wooden front door? It's an old-style solid wooden door." That's a question someone wrote.

Eric Berlin: And I can view the next article, which will be, God willing, a response. Perfect.

Andrew Kantor: Now this person, Jerry, wrote back. First, if you notice, he puts these little angle brackets up there, which indicates that's what David Stevenson wrote, and then he replies after that: "One way I can think of is to cut a notch in the door and insert a wedge. After you apply glue to it, this will force it to bend a little. You can make several such cuts. Of course, this can only be done if the door is painted."

So this is the basis of UseNet News.

Eric Berlin: In a nutshell.

Andrew Kantor: You write a message, you post to an appropriate newsgroup, and people write back to you. It's very simple.

UseNet News is hard to describe, but it's really very simple. You write a message, you post it; instead of sending an e-mail message to a person, you're posting to a newsgroup so anybody can see it, and then other people can reply.

[Let's talk about] problems with UseNet News.

Eric Berlin: The UseNet being such a huge community, there are many people that use UseNet News, and not all of them are nice. Would that they were, but they're not.

Andrew Kantor: Not all of them think the way you do, and not all of them share your religion, morality, or political views.

Eric Berlin: People get into debates, and people get into full-fledged arguments. Under the best of circumstances, they're at least talking about the issues. Under the worst of circumstances, they are insulting each other.

[Tape change]

Andrew Kantor: You like Rush Limbaugh, too, and that makes you even worse.

Eric Berlin: People get angry when they see a newsgroup that discusses homosexuality, and they go over there and they just [start writing things like] "You people are all dirty and..." This is an unprovoked "flame." This is what's known as a flame.

Andrew Kantor: A flame is a nasty message that you post to someone which kind of attacks who they are. I go to the cats newsgroup and I post a message, "I just got my first Siamese cat and he's wonderful." Someone may just say, "You idiot, Siamese cats are ugly and they're stupid and they smell bad and you're a jerk for liking them." He may write this. I may write back and say, "I'm a jerk?! Well, you're a —!" You get the picture.

Eric Berlin: Welcome to the flame war.

Andrew Kantor: Many people get involved. Flame wars take place in newsgroups like the political newsgroups, like alt.fan.rush.limbaugh. Or talk on abortion, that's a fun place to go.

Any issue you can imagine. The death penalty, NAFTA; name an issue and there's a newsgroup about it, and the people are yelling and screaming at each other and being children.

M: [inaudible]

Andrew Kantor: I was hoping nobody would ask this. Yes, there are ways to start this. There's an involved process for creating a newsgroup; it involves getting people on the Internet to vote on it.

Eric Berlin: You can create your own newsgroup. The trick is, how do you get access providers like PANIX to take on that newsgroup? So people rely on a sort of a voting process which has evolved, and if it passes the vote then access providers say, "Oh, okay, we'll take that since there's so much support, we'll take on that newsgroup and we'll let our users see it."

Andrew Kantor: But there is a process and there are files on the Internet like "How to Get Your Newsgroup Created," and there are people who just create newsgroups left and right.

Eric Berlin: We don't have the time to go into that in tremendous detail. We will tell you where to get information for that, though.

Andrew Kantor: [There's a term called a] "spam." One good way to get yourself some flames — and flames are not regulated to UseNet, you can get yourself some flames in your e-mail box as well — one good way to get yourself flamed is to "spam." Spam means to post the same off-topic message to dozens, if not hundreds, of newsgroups. People tend to do this because they are advertising something. They are advertising boots in the bowling newsgroup.

Eric Berlin: Or fishing gear in the political newsgroup. People say, 'oh, there are millions of people on the Internet and I can post a message to UseNet News.' The prototypical example of this is — I'll run through this quick — the famous example is that of Kantor and Siegel.

Andrew Kantor: No relation.

Eric Berlin: They are two immigration lawyers out of Arizona.

Andrew Kantor: Scottsdale, Arizona.

Eric Berlin: They saw the UseNet and they saw 10,000 or 12,000 newsgroups and they saw an opportunity, and they posted the same message advertising their Green Card services, saying they'll help you get your Green Card. They posted the same message in every single newsgroup out there.

Andrew Kantor: So people came to the bowling newsgroup and saw a message for Green Card services and said, "this is a bad thing."

Eric Berlin: Their argument was, "well, immigrants just don't read the immigration newsgroup. They could be interested in bowling or whatever."

Andrew Kantor: And they said, "hey, it's not illegal, is it? We're allowed to do it — free speech. It's our right to post wherever we want."

Eric Berlin: The problem with this is — they're not without a small point — but the problem with this is that if everybody was allowed to post everywhere, then what is the point of a newsgroup hierarchy?

Andrew Kantor: Why have topics?

Eric Berlin: It's like opening up your regular mailbox and finding 16,000 pieces of junk mail, and one real letter and a bill.

Andrew Kantor: One bill, you're lucky.

Eric Berlin: If you go into rec.bowling and you see hundreds and hundreds of advertisements for things unrelated to bowling and only a few messages about bowling, well, then UseNet has basically come to a halt. So the UseNet community interrupted Kantor and Siegel's little plan.

Andrew Kantor: Because in order to sell their Green Card services they had to give little tidbits of information, like their phone number, their address, their fax number, and their e-mail address. People on the Internet took advantage of these little bits of information.

Eric Berlin: Well, their Internet access provider was shut down because of all the hate mail they received.

Andrew Kantor: That is no joke, because the provider's computer can only hold so much e-mail waiting for people to retrieve them. Eric's computer holds Eric's e-mail until he retrieves it. They got swamped and they had to shut down.

Eric Berlin: The UseNet community had their address. They received untold numbers of pizzas and magazine subscriptions, untold numbers of prank calls. And their fax number —

Andrew Kantor: I love this, please let me tell this one. I love this story. This is what they did in the fax machine... People faxed them. People took a piece of black paper, construction paper, taped it into a loop and faxed it to them. Now, on your end, your fax is just scanning this paper, and what happens to their toner cartridge on that end as it just churns out page after page of black paper? It blows out the toner. That's what they did to Kantor and Siegel.

Eric Berlin: What truly makes them unique is the fact that they remain unapologetic to this day.

Andrew Kantor: They wrote a book called *How to Make a Fortune on the Information Superhighway*.

Eric Berlin: They claimed that "well, we got hundreds of responses and made lots and lots of money." They claimed to have made \$100,000 in business from that initial spam, but I don't believe it for a second.

Andrew Kantor: They're out of business now. I haven't seen them around.

Eric Berlin: I haven't seen them around. They started a company that will allow you to spam. They will spam the Net for you. A ski resort in Colorado took advantage of them, and when I called that ski resort to find out what the result was they claimed that reservations went up over 200% over the course of 48 hours.

Andrew Kantor: Which is like, wow.

Eric Berlin: They were very impressed. But I'm wondering — suddenly, by seeing this message, people from all over the world are going to suddenly come to Colorado in the course of 48 hours? How many of those 200% are going to show up?

Andrew Kantor: Yeah. How many of those reservations are real and how many people are saying, "yeah, yeah, I'll make a reservation."

Eric Berlin: This is not how to advertise. As I said, we will be talking about how to a little bit later.

Andrew Kantor: And that was just their phone number and e-mail address and stuff they made available right now. There's a spam going on with magazine subscriptions — and I'm sure we're going to write about this in the magazine — where people on the Internet have found out the social security numbers, the job histories and all sorts of other information about the guy who's doing this spam and they're just posting it to the Internet.

Eric Berlin: Let's move on.

Andrew Kantor: Copyright violations. When *Star Trek Generations*, the movie, was coming out, a few months before it came out people found in the Star Trek newsgroups the entire script of the movie. I have a copy of it. Someone posted the entire script. Well, Paramount was kind of upset and they wrote to the newsgroup and said, "Please, we've worked very hard on this. We're trying to make an entertainment movie. Please don't put this script out there." They were asking nicely to remove it, and people did and the script kind of disappeared from that. Well, that was a good example.

Playboy centerfolds are routinely put up there because I guess they figure people can't actually go down to Barnes & Noble and buy it. That's a copyright violation.

The most famous right now is the Church of Scientology. Ex-members of the Church of Scientology posted information to the Internet about the Church, about what they do, about Xenu, the head of the Galactic Federation who — and this is true, [according to] the people who write *Dianetics* — Xenu came to earth millions of years ago trying to solve the overpopulation problems of his planet by bringing people to earth and chaining them to volcanoes and dropping hydrogen bombs on them.

Eric Berlin: Scientology calls this a copyrighted trade secret of their Church.

Andrew Kantor: This is not a joke, I am not kidding. This is what Scientology believes. One PR person said to me when I interviewed them, "Well, how would you like it if somebody posted your religion's top secrets?" And I had no reply. People in Scientology were very upset.

Now, as much fun as we can poke at them, talking about Xenu and all the stuff they're worried about, they do have a point. If you're a company, if you're Coca-Cola and the formula for Coca-Cola gets on the Internet — I mean, there are trade secrets and copyright violations that come up all the time.

What can you do about it? Very little, because information spreads so fast it's often hard to figure out who posted it first. People can post anonymously and it's a whole legal wrangle to try to find out who they are. There's not a lot you can do. Copyright violations are rampant. Songs and excerpts from books and all sorts of stuff are always on there, and scripts for Star Trek and the stuff about Scientology.

Eric Berlin: The best thing to do about it, since the best source of information is the people who created the information in the first place — *Playboy* beat those people that would scan centerfolds and post them on the Internet. *Playboy* beat them to the punch by opening up their own site and offering the centerfolds themselves and selling advertising on those pages to generate revenue for themselves.

Andrew Kantor: Which leads us to the problem of dirty pictures. UseNet people routinely post pictures — I mean, you can scan in a *Playboy* centerfold or you can take a picture of your girlfriend or boyfriend and put it up there, and people do this all the time. Some people think that UseNet News is just full of this horrible pornography. It's not really a problem.

Out of 16,000 newsgroups there are about 100 that are sex-related, and about half of those have pictures in them and about a quarter of the messages are actually pictures. Most of it is just talking about it, and things like how to make money fast and advertising bicycles and stuff like that.

Eric Berlin: We're not saying it's not out there. It is.

Andrew Kantor: There's pornography out there. You can go look in the alt.sex.bestiality newsgroup and there will be 100 messages in there and two will have to do with what I did with my gopher or my hamster or whatever. It's out there, but it's really not a problem. We put it in the list of problems to kind of deflate it.

Eric Berlin: If you want to solve the problem for your own family, even if the thought of this little amount bothers you — and I can't blame you if it does — we do not necessarily need government regulations on it. There is perfectly legitimate software out there [that can prevent this]. One is called *Surf Watch*, and one is called [Net Mammy].

Andrew Kantor: [There's also] *CyberSitter* and *Crossing Guard*.

Eric Berlin: You can put these on your computer and they come preconfigured with hundreds of pornography types that they can block. Somebody actually researched this, I guess.

Andrew Kantor: Tough job.

Eric Berlin: They're preconfigured with all the sites that you probably do not want your kids to go and see, and you can add in more as you hear about them or whatever.

Andrew Kantor: So if you don't want your kid to see alt.sex.bestiality, you install the software. If he tries to get in it will say, "sorry, you cannot access it." It's very simple.

Eric Berlin: It is not a Herculean task to avoid pornography. It just isn't.

Andrew Kantor: The other thing, of course, is that government regulation can't stop it because a lot of this stuff comes from outside the country, and in most other countries people just don't care about this. So when we say dirty pictures we're also talking about all the stuff that you don't like that is out there — and I'm guaranteeing you there's stuff you don't like out there. As a French person once said to me, "You can always find an American offended by something." And that's the truth. There's lots of stuff out there on UseNet that you won't like.

Eric Berlin: Questions about UseNet?

Andrew Kantor: No? Good!

Eric Berlin: [Then there's] Internet Relay Chat. Internet Relay Chat is the CB radio of the Internet. It is, as somebody said, in real-time. We're not really going to demonstrate this because there's not a whole lot happening there. All the colleges are on the Internet Relay Chat, so it becomes a huge frat party. It becomes — it's like 30,000 men trying to pick up five women.

Andrew Kantor: It's like CB radio mixed with a frat party.

Eric Berlin: When you go on, you join a channel.

Andrew Kantor: You use IRC, Internet Relay Chat software. You connect it and you get the list of channels that are available, a list of hundreds of channels.

Eric Berlin: Hundreds and hundreds of channels. You join one that is active. All channels have a little pound sign in front of it; so you join #theater and there are people there supposedly discussing theater and whatnot.

Andrew Kantor: There's "Star Trek" and "Sex" and "Melrose Place" and "Gardening."

Eric Berlin: Five minutes before the OJ verdict came in, there were hundreds and hundreds of people in the channel "OJ" on the IRC. It was quite a little Internet event.

You can go and play games with other people who are sitting at their computer at that time.

Andrew Kantor: As you type, as soon as you hit "enter," everyone else on that channel sees what you have typed in. That's how it works. It's kind of fun. It's a diversion. It's not a major Internet tool, but we like to mention it.

That's about it. When we get back, we're going to kind of put all this together and we're going to talk about information. We've been covering communication. We're going to talk about information on the Internet, getting it, and different ways of searching the Internet and making it a useful thing. Here we're giving you a toolbox; we want to tell you how to build a car with your toolbox.

Let's break for lunch now.

TUTORIALS INTERNET 102



SPEAKERS

Andrew Kantor

Senior Editor, *Internet World Magazine*

Eric Berlin

Contributing Editor, *Internet World Magazine*

Andrew Kantor: [You can find the December issue of *Internet World* on] newsstands; if you're a subscriber you'll be getting it pretty soon. We review all the suites, Windows, what's available for the Macintosh, we talk about what's coming up, just in case you want to check that out. In fact, the January issue is going to cover some things that came out after this issue went to press. So between December and January, you can find out everything you want to know about all the Internet access software.

Eric Berlin: In this second half, we're going to be talking about information on the Internet. We will be focusing on the WorldWide Web; although there are a couple of other lesser places to get information, and we'll be discussing those as well. After that, we're going to be talking about how to use the Internet as an integrated whole; how to use UseNet to find an e-mail address of a person that you want to talk to about a certain topic; using the WorldWide Web to get that information in the first place, etc. How to use the whole thing.

What we'd like from you guys — later on, we're going to be giving some examples on how to find a certain product or something — but we want to know how you want to use the Internet. You came in here saying, how can I use the Internet to do such and such? We're up to the challenge, we hope, and we want to hear some suggestions. We will use your examples for...

Andrew Kantor: If you say, I want to buy a car — how can the Internet help me to buy a car? Or my kid is into dinosaurs, how can the Internet help me? That kind of question. How can the Internet help me do — fill in the blank. Think about these.

Eric Berlin: We are completely unimaginative and we kept coming up with how do I buy such-and-such a product? Okay, how do I buy this product?

Andrew Kantor: We're actually very boring people when it comes down to it.

Eric Berlin: So we have to rely on you guys for our examples. But that's in the second half. So just start thinking about that now. In the meantime, information on the Internet.

Andrew Kantor: Information on the Internet. You've got seven million computers out there and you can bet your something or other —

Eric Berlin: Bottom dollars —

Andrew Kantor: — bottom dollars or your bottom yen that there's lots and lots of information. All these different people putting it out there. The question, is how do you get hold of it? Well, it's great that it's out there but it doesn't do me much good sitting on a computer in San Jose or Tokyo or France or whatever. It will never do you any good in a server in France because it's all in French, which is an interesting thing people talk about.

What is the language of the Internet? Is everything in English? Yes, most things on the Internet are in English simply because the United States, people in the United States make up more than half of the Internet. So everyone kind of realizes that if you want people to understand you, you've got to speak in English. Except the French, who continually hold out and put things up in French and nobody actually sees what's up there. This is true. You're supposed to kind of least snicker and then we're going to get in the mood for the next...

Eric Berlin: Oh, make a funny joke and then they'll laugh. Come on, let's go.

Andrew Kantor: So what's on the Internet. There are three forms of information out on the Internet. There are just plain old files. You have files in your computers. Your software, that's files. You have your budget, that's a file. Bad poetry, that's a file. There are Gopher menus, which are a text-based way of getting information from the Net. And there are WorldWide Web pages, which are probably the best-known thing. Incidentally, this is the most proper way to write "World-Wide Web." Spaces, hyphenated, how do you dot it. Although in the magazines we [don't] put a hyphen between the World and Wide because technically it's one word and a second word with three capital W's, but that's another story.

So, once upon a time, when there were, say, a hundred computers on the Internet and a couple of thousand people, at most, using it, it was easy to get a file. You would call up your friend who worked on the other computer because everyone who was on the Internet knew everybody else. It's kind of like living in a neighborhood. You just knew because these were all computer geeks and they all kind of knew one another and got together.

You would call Johnny at whatever institution he worked in and say, "Johnny, have you got that file on how to rebuild a transmission?" or something. And he would say, "Oh, sure" and he'd tell you it's on this computer in this directory — or this folder for you Mac people — and this is the name of the file. And you would say, "Great" and you would use your computer to connect to it in a variety of ways and get that file. That's how it worked. Word of mouth. You would call and ask somebody.

Well, that was great back then. But nowadays, with 20 or 30 million people on the Net and seven million computers and billions and billions of files, it's a little more difficult — although you can still call up people and say, "Hey, I understand you've got this file. Where is it? What machine?" They will tell you where it is and you can get the file using a process called "file transfer protocol," or FTP. You can still do that. It's a lot harder. But you know these files are out there.

Where are they? It's kind of like being in a library and knowing there's some information in some book and there's no card catalogue and the librarian is very busy right now. Where do you find this information? Oh, and the books aren't labeled either. The spines aren't labeled — the books are. That's what Internet is in terms of finding a particular file. It's not easy. There are search tools out there. One of them is called Archie, and Archie will let you search the files that are out on the Internet if you know a particular file name.

So let's say you wanted to rebuild a transmission for a 1978 Datsun B-210. Well, what's the file name? Would it be "transmission.doc"? Would it be "rebuildB210transmission"? If you don't know what the file name is, you cannot find it because you have nothing to search on. That's why finding particular files on the Internet is not the way people go about getting information.

Now, if you want a particular game, if you want a patch for software, an upgrade or piece of software, well, that's great. You want a particular file. But in general, you're not going to be looking for files on the Internet.

In cases where you are looking for files, you might see a message where people will talk about files. For a great list of recipes get the file "cooking.text" from ftp.bigcorp.com in the public directory.

Eric Berlin: You might see that on a newsgroup, you might have read it, and then you can just go and check it out yourself.

Andrew Kantor: In fact, in the magazine we print FTP sites for information. FTP, file transfer protocol, that means get the individual file, and all you need to know is the name of the computer, where it is, the name of the directory or folder, and the name of the file.

A shareware version of the software is at ftp.somewhere.com. That's the computer. The pub games directory and cardshark.exe. That's what you need. Again, people don't really get that unless you want a particular piece of software or a particular file. You're not going to use FTP. It's just kind of clunky. The reason being, you don't care about the file name. The file name is not important. You don't care what file contains the information you want.

You want the information. You want to know the population of Fiji. You want a complete list of light bulb jokes. You want to know how to rebuild the transmission of a 1978 Datsun B210 — you don't care what the file is called, you need the information. Because the Internet got bigger and bigger and people realized that, well, people want information, not particular files, systems were developed — culminating in the WorldWide Web — systems were developed to make it easier to find the files.

First was Archie to let you search for files and file names; but then came Gopher. Gopher was developed at the University of Minnesota, where the mascot is the gopher. Gopher gives you menus. You have e-mail software, UseNet news software, you have Gopher software. Gopher gives you menus.

People owned a computer. They had a lot of files on it, files of text-based information, because Gopher is, for the most part, text-based. But people didn't know their file names. So what do we do? We create a menu. We'll put a menu up there and it will say, do you want 1, this; 2, that; or 3, this. I want to know how to rebuild transmissions and you would choose what you wanted for a menu. So you had all these files in the basement. Then you have a menu to pick something and it would suck the file up out of the basement and give you the file you wanted.

General Motors may have Gopher information available on the Internet. You use your Gopher software, you tell your Gopher software, connect me to the General Motors computer, whatever the name is. You might see something like this:

1. Chevy Information/
2. Buick Information/
3. Olds Information/
4. Saturn Information/
5. Other Car Companies/

You say, I want Buick information. It ends in a slash, which means it leads to sub-menus. That's what Gopher looks like. You say, Gopher software, take me to General Motors. You see a list and you hit 2, Buick Information/ — and it might bring you to another menu that would say:

Choose:

1. For Gas Mileage/
2. For This Week's Recalls/
3. Models and Availability/

That kind of thing. Gopher just arranges all these files — these text files that these computers have — into a menu. So the files are still there. You can get the files individually or you can go through Gopher and see what's in them.

Gopher is old technology. Gopher is text-based and people are not text-based. We like visual things. Gopher was a good way of organizing some information, but it wasn't all that wonderful.

Eric Berlin: I would say that *Archie* is also becoming old technology. Both Gopher and *Archie* and FTP have been rolled into, not the WorldWide Web, but Web browsers, which we're about to show you will also allow you to look at Gopher menus and also allow you to transfer files.

Andrew Kantor: You no longer need separate software to do these things. It used to be you needed Gopher to do Gopher. You needed an FTP application to do FTP. Now it's all rolled into one.

Eric Berlin: So everything basically becomes the WorldWide Web.

Andrew Kantor: WorldWide Web — the way everybody's making information available. Nowadays, if you are putting information on the Internet — and if you remember from Part One, that means you are putting information on your computer, which is connected to the Internet — if you're putting information on the Internet, you're putting it on the WorldWide Web. There are a few people who are putting stuff in Gopher; very few, the US government is still lagging a little behind. But if you are putting on information and making it available to other people, you are putting it on the WorldWide Web. The WorldWide Web is part of the Internet.

The WorldWide Web is a publishing platform. You have, basically, only your computer; you can create pages of information. If I take my WorldWide Web software — it's called a browser — and I point it to someone's WorldWide Web site, I will see a page of the WorldWide Web. (We'll show you that in just a second.) On that page there can be formatted text that is bold and italic and big and small. You can put pictures, you can put animation, you can put sound. It's kind of like you can create your own magazine page on the WorldWide Web or series of pages on the WorldWide Web.

Every page has its own address, so I can say, oh, I'm going to advertise: I'm Sony Pictures and I just created a movie called *The Scarlet Letter*, whatever, and you can see information about this movie at this Web address. This is the address of the page and I would take my Web browser and point it to that page.

A page can have all sorts of things and that's why it's so big. Gopher just gave you text. The WorldWide Web gives you formatted text and pictures and graphics and all sorts of wonderful things. It makes everybody the publisher of a magazine and the writer of a magazine and the editor of a magazine. There are people now who have created their own on-line magazines, on-line newsletters, making information available on the WorldWide Web because it lets the creativity come out and make information available.

In the old days, you could put a file... I could write a poem, put it in a file and maybe somebody would take the trouble to download the file — find it and download it — but probably not. But now I can put it on my WorldWide Web page, so if someone comes to my Web page I can have all this information, whatever I want there. I can also, by the way, create links from my Web page to other people's Web pages. So I can say, I really like spaghetti and I can have a link so that if you select the word "spaghetti" with your mouse, it links you to the Ragu page where Ragu has information.

Now I can link to any public page, any page on the WorldWide Web and anyone can link to me if they want to. In fact, if you go to Internet World — our page is on the WorldWide Web — there are links to my page and I have links back to theirs.

So the WorldWide Web makes everybody a writer and a publisher and it's the way to make information available.

Eric Berlin: Are there any questions?

Andrew Kantor: We're going to go a little more on the WorldWide Web.

Eric Berlin: We did go over FTP and Gopher. Any questions on any of that? Nobody cares about that. They want the WorldWide Web.

Andrew Kantor: Nobody cares about FTP and Gopher, although they are very useful and there are cases when you want to use FTP or Gopher.

If you're a software company. But, as I said, you'll find all sorts of stuff — formatted text, graphics, photographs, sound and video, forms for user input. So I can have a Web page where I have a magazine and my poetry and I can have a little box on the bottom and I say, "enter your comments in the box and click the Send button." The Send button is part of my page and I can get input from users. I can have users type in things and I can search for them. I can take input. It makes the Web interactive. I can take input and act on it somehow. Maybe it's just, "send me a message," and you write your message here and click there. We're going to show you Web pages that do that, but just about anything you can imagine can be put on a Web page now.

If you're a store you can put a form that says, "enter your credit card number, enter your mailing address and we will send you whatever it is you want to order." This is why the Web is so important; and, as I said, you have links to other pages.

Corporations will put in information about themselves. Bowling, Ragu, Mecklermedia, General Motors — any corporation, any organization you could imagine probably has a Web page with all sorts of information about themselves. Whatever they want to tell you. Maybe you can order things. Maybe it's just chatter about themselves.

You'll find stores, shoe stores — well, heck, you want a particular kind of shoe, you don't necessarily have to come into a store near you. You can buy it from me. Mail-order catalogues have been around since the 1700s. Well, now, it's Web-order catalogues. It's the same thing. You can browse a catalog, you can order things. Stores are doing that.

And people collect information. Hey, I have the ability to put up a Web page because my Internet service provider says that for \$10 a month, you can put Web pages on our computer. So I can put anything I want. Well, maybe I'm a big *Star Trek* fan. I can put all sorts of information about *Star Trek* or *Babylon 5* or *Beverly Hills 90210* or whatever you want.

I want to collect information on a particular subject. Maybe I'm a big gardener — I can put gardening information up there. Maybe I just learned something new. Hey, I just found out how to rebuild a transmission, so I'll put on that information. It's my page, I can put whatever I want on it.

Lots and lots of people put information up there, and programmers do all sorts of neat things just to show off. You can find a Web page in Estonia that has an Estonian to English conversion dictionary. Type in a word in English and it converts to Estonian or vice versa. Some programmer puts that up there.

But all sorts of information is up there; and, of course, magazines and newspapers — *Time* magazine and *Time-Life* is up there. *Internet World* is up there. *The New York Times* is on

the Web, to an extent. *People* magazine. All these magazines are putting information on the Internet. How are they doing it? They're doing it on the WorldWide Web.

Eric Berlin: As well as people who are creating specific magazines for the Web. They didn't have published magazines. But they looked at the Web, and they said, "oh boy, here's an opportunity for us," and now there's a magazine called *Word* that is only available on the Web. *Living Digital* is a magazine being put out by Prodigy. They didn't have anything published beforehand and they are all offering all kinds of content and live chat, even with people. Yes?

M: [inaudible]

Andrew Kantor: Very good question. We'll get to it in one second. My magazine is on the Web. How can a magazine make money if you're putting stuff on the Web?

The reason people are making these on-line magazines — by the way, it's expensive to make a magazine, get it printed, get writers, make something large enough, get it on newsstands. I mean, there's a lot to deal with in trying to get a magazine published in paper form. But on the Web, if you create a good magazine, it's just a matter of doing a little coding, a little computer-eze.

The language is called HTML for Hypertext Markup Language. That's the language of the WorldWide Web. It's basically just plain text, typing things in. When we show you a page, we'll show you what the coding looks like. And you can create a magazine about whatever subject you want — all about yourself, if you think you're that important that people will come and see and read about yourself this week.

Now, magazines are putting content on-line. Well, how come people are saying, well, why should I subscribe to *Internet World*? I can get it on-line. Well, there are different reasons. One is, not everybody is on-line. There may be 30 million people around the world, but not everybody is. So magazines are really not worried about people cutting in or on-line versions cutting into their sales because not that many people are going to do it.

They are also not worried about it because you can take a magazine on the bus or the bathroom or stick it in your bag to maybe read in a hotel room. It's not that easy. People don't like reading from a screen. Your eyes start to water and they get all tired. People like a paper magazine. It feels really good.

Eric Berlin: Magazines are not putting all of their content on the Web. *Internet World*, for their present issue, I think they make our column available. I think they make a couple of news items available.

Andrew Kantor: You can't sell enough magazines with our column in it, so they have to put it on-line to let everybody read it.

Eric Berlin: Just a few things to whet your appetite to go out and buy the full thing.

Andrew Kantor: You'll find the table of contents.

Eric Berlin: It's basically advertising. Back issues are fully available, I believe.

Andrew Kantor: The way we work is, the current issue, you have a couple of articles; the one back, you have some more; one back, you have some more; and then like four issues back, you can get the full text and it's searchable. So that's what we do. That's our model.

Playboy does that. *Playboy* has the interview and a couple of articles and then a table of contents. So it's like, okay, I want to buy it. People actually go to the *Playboy* page to read the articles. So that's one way of doing it.

The other way is to say, "let's put the whole text up there and see if it really cuts into our sales." And people find it doesn't because it's like... they won't put all the pictures up there. They'll put some of them. And people like the feel of a magazine. Does that answer your question?

Of course, people put information about themselves because they can.

Eric Berlin: So, this is the way...

Andrew Kantor: It's true. There are personal Web pages up there by the thousands because people have egos and it's like, you know, I want to put information about myself up there; or if you give someone a business card and you look at a business card, okay, it's got my name and my company and my title, you know, got a little bit about me, but if I point you to my Web page I can say, "you want to find out more about me? Come to my Web page. I'll tell you what I do, what I cover, why I'm around."

Eric Berlin: A whole résumé is there.

Andrew Kantor: Yeah. People put résumés on-line. People put job listings on-line. A lot of companies will say, "jobs available."

Eric Berlin: This is how to advertise on the Internet. Posting to thousands of UseNet newsgroups is a sure way to hell. Here is the way to do it for real.

Andrew Kantor: A sure way to hell. Yes, we have checked with the Catholic Church and you will go to hell for advertising on UseNet news.

Eric Berlin: Furthermore, if you have an interesting Web page, this is where the gold rush is. If you have an interesting Web page, if some guy — some programmer stayed up one night and came up with a Web page which is actually a paint-by-number program. You can paint trees and homes and things like that, and he thought it was just a cute little thing to do, and suddenly all these people are coming to his Web page to try it because people like that kind of wacko thing.

Andrew Kantor: Or in some cases, to come back, maybe he puts information about a particular subject that he updates every single day and lots of people are coming to check that information.

Eric Berlin: He suddenly realizes he's got a little property on his hands.

Andrew Kantor: He's got a billboard by a highway that lots of people — I shouldn't have said highway. He's got a big billboard that people are driving by, people are coming to see this billboard that he has created.

Eric Berlin: People are now selling advertising on their Web sites. In a few minutes, we're going to show you *Yahoo*. *Yahoo* was created by a couple of college students who, once upon a time, when you were able to do something like this, collected every single page on the WorldWide Web. Don't even try it.

Andrew Kantor: David [Philo], by the way.

Eric Berlin: [They collected] every single page on the WorldWide Web and list them in categories and make a sort of index.

Andrew Kantor: They came up with a table of contents for a lot of the Web; not all of it, but a good chunk of the Web. Interesting pages, divided by categories.

Eric Berlin: Now the Web has exploded and there's no way to keep up with it, but it's still one of the most traveled sites on the WorldWide Web. So they're selling advertising. Very expensive advertising because people know that Net surfers go to the *Yahoo* page and they know the advertising is going to get seen.

Andrew Kantor: So two Stanford students who just... they weren't even that creative. All they did was create an index of stuff that was already out there and put it on their Web page just for the heck of it. They are now making millions of dollars in advertising because everyone knows — oh *Yahoo!* *Yahoo!* *Yahoo!* They're out there on the floor somewhere. So that's another reason people are putting stuff on the Web because if a lot of people are coming by, then why not sell ads?

Before I go to this, you may hear the term “hits.” Our Web page gets 10,000 hits a day. A hit is a misnomer. It's kind of a vague idea that someone has seen something on your page. If you have, like, five pieces of text on your page and someone views it, that's five hits. But hits is kind of like, right now, the only way people can talk about how popular the Web pages are. When I show you a page, I'll explain why hits doesn't really mean anything because some Web pages can get... just looking at one page can be 50 hits. Looking at another page might be one hit.

Eric Berlin: This is one of those things — how popular are Web pages is one of the things [where] we are on the cutting edge of technology. What we're saying here might be different in two weeks because people are, companies are coming out with rating systems. Even Nielsen is getting involved in this. Rating systems to find out precisely how popular things are, so the term “hit” is going to become antiquated soon enough as the technology gets more specific.

Andrew Kantor: So what you might see that tells you every page on the Web has an address. It all begins with `http://`. Every page on the Web begins with `http://`. It stands for Hypertext Transport Protocol. So, `http://www.bigcorp.com`. That's our Web page or our Home Page. A Home Page is considered the first page you see. So Ragu has five pages on the Web — the first one you come to is their Home Page.

Another one may say, we're on the Web at... and they'll give you a specific `http://www.somewhere.com/info/home.html`. They may give you a specific address. This tells you to go to a particular computer, particular directory, particular file. This one is saying, just come to this computer, and it's automatic, you're going to see the file we want you to see.

Eric Berlin: I'm going to take this off...

Andrew Kantor: What we're going to do...

Eric Berlin: This computer here is connected by a dial-up connection. It's on a 28.8 modem, which is fast as modems go, but way slower than a network connection, which is what this computer has. So I'm going to jump over here and try not to electrocute myself.

Andrew Kantor: Or me. We were talking about whether we should demonstrate the Web. This is how you would see the Web with a 28.8 modem, but then you're going to get very frustrated because it is pretty slow, especially when there are pictures. Let's focus this.

Eric Berlin: Where shall we go?

Andrew Kantor: Let's go to *Yahoo*. If you look at the top, this is a WorldWide Web browser. This is a piece of software that will allow you to view the WorldWide Web.

Eric Berlin: It's called *Netscape*.

Andrew Kantor: You may have heard of it.

Eric Berlin: It's taking over the country.

Andrew Kantor: It's the successor to *Mosaic*. The people who designed *Mosaic* while at school, left school, joined *Netscape Communications Corporation* and created *Netscape*.

A guy named [Mark Andreson]. He was the main programmer at the National Center for Supercomputing Applications in Illinois. He designed *Mosaic*. He came over to *Netscape*, where he now makes \$58 million dollars — he's a 24-, 25-year-old programmer. So people are making money on the Internet.

Let me show you, as fuzzy as it is, what this looks like. Okay. This is *Netscape*, and let's start with *Yahoo*. This is the *Yahoo* list that we were talking about. Now, if you look at this page, there's not a lot on it. There's this nice fancy graphic that says *Yahoo*, and you can't see it very well, but there are buttons you can click on up here with new cool popular headlines. Anything in blue is something you can click on.

Yahoo has a table of contents, so by definition you can click on just about anything. And there's also a box where I can search for something. So if I were to click on a button that says Arts, it brings me to another list, another page of *Yahoo*. Arts. Subcategory listing: Indices, Architecture, Art History, Body Art, Ceramics, Children. This is the *Yahoo* page, and I can click on literature: awards, beat generation, books, children. *Yahoo* is an index of the WorldWide Web.

Let me show a general page. This is why I always start with mine. This is my page on the Web. Very simple. Hello and welcome to my Web page. This is as basic as we can get because I don't have time to do more. Hello and welcome to my Web page. I've put a little text in here. You can't see it, but you can click on Eric's name. You can click on some things. If you scroll down, I put a picture up there. If you scroll down, there's some personal stuff. Who I am, what I've done. I just put this information about myself because people are always asking for information about me, so I said, come to my Web page and I put links to Eric. I put links to other pages. I created this Web page.

Go to Ragu.

Eric Berlin: Ragu.

Andrew Kantor: *Netscape* is unable to locate the server.

Eric Berlin: Are you sure it's www.ragu.com?

Andrew Kantor: Yeah. Okay. This is the Ragu Home Page. Ragu, the company. Mama Cucina, brought to you by your fellow Netheads at Ragu. Well, I haven't seen anyone as hungry-looking as you since my great Aunt Lucilla ran around chasing a chicken with a fork.

Scroll down a bit. They put a picture up.

Mama's new sauces. Mama's Italian cookbook. You can click on any of these things. The people at Ragu have done this. Why? Well, out of the goodness of their hearts and for no other reason, they're putting this information on the Internet, specifically on the WorldWide Web so you will come and look at it and that's all they want.

Oh, by the way, the word Ragu is going to be all over the place. Every time you see it they're advertising their own product. Look, new recipes, new sauces.

Eric Berlin: Learn Italian — that's a good idea.

Andrew Kantor: Is there a question? You, the troublemaker?

W: [inaudible]

Andrew Kantor: *Netscape* is only a piece of software. It does not contain any information of its own. *Netscape* lets you view pages on the WorldWide Web, that's all it does. And *Netscape* has some buttons on it, which we don't have up here, like, let's say, search. What that does is it just connects you to a page on the Web that the people at *Netscape* knew about that lets you search. That's all it does — all *Netscape* does is let you view pages on the Web. They have put some of those pages automatically, if you click search, it bring you to a search page.

M: [inaudible]

Eric Berlin: There are search engines out there, and if you go to them often enough, which you will, you can set up bookmarks for them and just learn how to type in www.yahoo.dot.com, just click on the right button, and you will be right over there.

W: [inaudible]

Eric Berlin: Oh yeah, you will get what you're looking for, and then some. If you search on a particularly... if you search on a common word, you'll find — somewhere in the midst of the information you'll get back — you'll find precisely what you're looking for, but it might be varied in 1,500 different pages about the same subject. When we do some searches we will demonstrate this very nicely.

Andrew Kantor Lots of people have said, "oh, the Web is so big, there are so many pages, and so much information out there, we are going to create search tools." *Yahoo* said, "we are going to create a table of contents, where you click up arts, and then click on something else, and you can make your way to something."

All the people — and then *Yahoo* kind of took this idea also — have created search engines. The best one out there is from a company called Open Text. Type in a word and it keeps track of as many Web pages as it can, as it physically can, which is thousands and thousands of them; and you type in a search sum, and it will tell you, "these following Web

pages contain the term you want.” So if you type in the word “Bill,” you’re going to find thousands of pages; if you type in “Bill Clinton,” you’ll find a few hundred pages; if you type in “President Bill Clinton,” maybe you’ll find even fewer.

Eric Berlin: We’re going to be showing how to search on the WorldWide Web, and how to use the Internet as a whole in the just a short bit. Does anybody have any questions about what you can accomplish on the WorldWide Web? What it’s for? How you link the things?

Andrew Kantor: Pages can contain anything. This page contains mostly pictures that you can click on. Click on something, click on Mama’s Italian Cookbook. Now, they are linking to pages — as I said, you can create a link to any other page on the Web — they are linking to their own pages, which kind of makes sense. You don’t have to link to outside pages, you can link to your own pages. So let’s see.

Eric Berlin: Lot’s of them, all of which will include Ragu spaghetti sauce, I am certain. Seafood.

Andrew Kantor: Whoa, so the people of Ragu have taken the time to put in the Web server all this kind of stuff. Pick another page. That White House stuffed...

Eric Berlin: You want me to write down this recipe real quick or not?

Andrew Kantor: Oh, oh, oh. Now there is one jar, 14.5 ounces, of Ragu Alfredo Classic pasta sauce; notice that title, as you can click on it, so you get the recipe. And, of course, they mention Ragu. You go there, and... oh, look, there is a picture of the label, and this is how Ragu gets you. So what they are doing is they have a billboard, they give you information, and they are counting on you to be, to hear Ragu, Ragu, Ragu, over and over again. I bet after this seminar, you are going to be in the store and you’re going to be thinking, I want Ragu. Now, questions over there?

M: [inaudible]

Andrew Kantor: Netscape is just software. I hope they don’t hear me on the show floor. Netscape is just a piece of software. It’s a very good piece of software — except for the newer version, which has some quirks — but it is just a piece of software. You have e-mail programs to send e-mail, you have Netscape to view pages on the Web.

This is the White House page. The White House, out of the goodness of their hearts and using your tax dollars, has created a page of information. An interactive citizen’s handbook. President’s Welcome Message, Vice-President’s Welcome Message, Tours, The First Family.

(Now I don’t think we have a sound player hooked up.)

Eric Berlin I don’t think we do.

Andrew Kantor: If we were to click on one of these, we could listen to President Clinton welcome us. We are not going to do this, but we could.

Eric Berlin: You can see the President’s welcome message in three formats.

Andrew Kantor: Test format.

Eric Berlin: I was very concerned for a moment.

Andrew Kantor: So this is what the White House has done. You can find congressional bills, also just stuff that...anything you can imagine is out there, because someone cares about it and someone has taken the time to do it. Paramount Pictures has *Star Trek* information, for example; lots of information about the series, products you can buy and all sorts of things like that. But I tell you, there is more information put out there by Trekkies who created their own pages with information that you may not know, information that Paramount may not feel like publicizing, or things that they care about. So people put lots of information.

Eric Berlin: Movie companies are taking domain names for movie titles, so you don't have to know Paramount put out such and such a film. Nowadays, you can just go to www.strangedays.com and you can go download a picture of whoever is in that movie.

Andrew Kantor: Jimmy Buffet was on the radio the other day. He was talking about things, and he said, "You know, people on the Internet know more about me than I do." And it's kind of true. I mean, you forget things about yourself, but people, if they care about you on the Internet, they are going to write lots about you.

Eric Berlin: That's an example of... strangedays.com probably isn't going to exist next year, but it's a good PR move for the time being.

Andrew Kantor: Get information about the movie — it's a teaser. Oh, I'm really into this movie. I want to see a picture. So, whatever you can imagine, people are putting it there. You can put pages on the Web. You own a company — you're a big company, you're small company. If you're a big company, you probably have computers connected to the Internet directly and you can put stuff on your computer. If you're a small company you go to your Internet access provider, and say, "hey, what do you charge me to put up a Web page?"

PANIX in New York charges \$10 a month, or whatever they charge, they charge a few dollars a month, and they will host your Web page. I call them up and say, "I want to do this" They mail me \$10 and they say, "okay, here is the directory." Anything I put in that directory is on the WorldWide Web. So I have to code the files.

Go back to my page, let me show the coding. That's Internet World's site iWORLD, which you will see out on the show a lot. I am supposed to talk it up — you know, it's a nice site, there is lot of information.

Okay, here is my page. I need to type all this in and say, make this big, make this small, make this a link. If you go into *Netscape* and view by document source, you will see this is what I had to type: Title: Andrew Kantor's Page; H3 up there, that's the H e-mail code; make this fairly large. Hello, welcome to my Web page.

Eric Berlin: There is the picture.

Andrew Kantor: Yeah, and I know the code, I have to type this in, put in a folder, which I have scanned and uploaded. I tell them how big to make the folder. I'm not a programmer at all. I didn't use a special tool to create this. I used basically *Note Pad* and two fingers, and I typed all this in. There is lots of software, lots and lots of software out there now to help you create Web pages.

Oh, just take this picture, drag it on, you design it, like right on the page, like desktop publishing, if you've done that, and then it converts it to HTML for you. I was old-fashioned and

somewhat lazy and didn't feel like loading up the software, so I did it that way. But you can create Web pages very, very easily right now. You can't create the fanciest pages in the world yet, but you can do a pretty good job. Okay, get this off the screen, please.

Eric Berlin Dialing up on to the Internet, this one, let's...

Andrew Kantor: Go back to *Yahoo*, or something, click on halt. Just get it off.

M: [inaudible] one page off of *Word* in your magazine?

Andrew Kantor: We are going to, we haven't yet. Later this year, in 1996, issues we will be looking at [will include] creation tools; we're going to be looking at the servers that companies use to put this stuff up. So yeah, we're going to be looking at that also.

There is a lot of freeware out there to help you create Web pages. There is a product called *Microsoft Internet Assistant for Word for Windows* that converts *Word for Windows* documents into HTML. It doesn't do a lot — it can put pictures in certain places, and it can do large and small text, and that's about it. But it is a really basic way of getting the coding down.

There are lots of books out there, tons of books on HTML coding. You don't need a big book, it's fairly simple. Coding in HTML and creating these pages — the more time you want to spend on it, the better you can make your pages. But for basics... I mean, my page took me half an hour to put up. It's really simple. If you read it, it says basically, "the only reason this is here is that people ask about me and you can all go to hell." Because some people put lots of links and junk in their page. I'm not like that.

M: [inaudible]

Andrew Kantor The question is, is there any better way to access this? I've got *Netscape*, I've got *Trumpet Winsoft*, *Trumpet Winsoft* is a freeware program for Windows that lets you dial-up an Internet access provider. You buy Internet in a box, it comes with a dialer, it's really easy to configure. The trouble... *Winsoft* is quite as easy, but it's free. [Inaudible] has that connection to the Net, and then you launch *Netscape*. What don't you like about it?

W: [inaudible]

Andrew Kantor: It doesn't work? What, it crashes a lot?

W: [inaudible]

Andrew Kantor: You have a dial-up connection.

W: [inaudible]

Andrew Kantor: Okay, the problems that your having — that it's dialing and stuff like that — that is a *Trumpet Winsoft* problem. You get what you pay for — *Trumpet Winsoft* is old and it's free. So it's not very good. I would suggest getting *Internet in a Box*, or *Chameleon*, or any of the other products. *Internet Suite*, *Emissary* — any of the other products that are out there instead of *Trumpet Winsoft*.

M: [inaudible]

Eric Berlin: Your problem is not with *Netscape*, your problem is with your dialer.

M: [inaudible]

Andrew Kantor: Yes, I should clear that up. We mentioned in here that when you connect to the Internet you're doing two things. One, you are dialing your provider, dialing their phone number with your modem, and making a connection. Once you have made that connection — ERRRR... you know how it sounds — you are now on the Internet. You can use any Internet tool: you can use the e-mail program that comes with *Emissary*; you can use the mail program that you downloaded from the Net Eudora; you can use *Mosaic*, which comes with *Internet in the Box*; or you can use *Netscape*. Any Internet program, they are called TCP/IP programs. Once you are connected to the Net, you can run any of these.

Eric Berlin: As we said in the first half, you can mix and match the applications to your heart's content, once you're connected to the Internet.

Andrew Kantor: So you have a dialer, and you have applications. Now these suites that you buy come with a dialer and 10 applications. Or you can assemble them yourself. You can get the *Trumpet Winsoft* freeware and you can configure that as your dialer, and then get these different applications, which is what a lot of people do, because the individual applications are better.

I use *Internet in the Box*; I use the dialer only. I use *Eudora* for e-mail; I use *Netscape* for the WorldWide Web; I use *Agent*. I just don't use any of their software except for their dialer. That's how I feel. That's what's better about the Internet than an on-line service — I have a choice of all this software I can use.

Eric Berlin: Now, using the Internet as a whole integrated thing. Basically, it comes down to if you have a question that you want to have answered, if there is information that you want to find, follow the same path each and every time. The WorldWide Web is best with general information.

Since general information is a good place to start, start with the WorldWide Web. Go to the search engines, as we will give an example in just a minute. Go to the search engines. And there are several different types of search engines. *Yahoo* arranges things in menus and allows you to search a little bit through those. *Open Text* will allow you to search for a phrase, as opposed to another search engine called *WebCrawler*, which will let you search for a few different kinds of words, though not necessarily in that order. For this reason, we like *Open Text* a lot.

Andrew Kantor: We will show you *Open Text* in a second. Basically, when you're looking for information of any sort on the Internet... For example, I need to know — my dad had prostate cancer, I got to find out about prostate cancer, what do I do? I want to buy a pair of rollerblades, what do I do?

Whatever information you want, there is a very distinct pattern of how to search the Internet for it. It is very simple: you search the Web, you look on the UseNet, and then maybe you send the e-mail. It's the same thing over and over again, and it works very, very well. Once you get the hang of it, it's very easy.

Eric Berlin: If you want to have a conversation with somebody, or get some questions answered that you weren't able to find on the Web, now you want to get more specific, go to UseNet news, see if there is a newsgroup about the subject that you're interested in.

Andrew Kantor: Gardening. Rollerblades. Transmissions.

Eric Berlin: The very first thing that you want to do is find what was called the FAQ file. This stands for "frequently asked questions." It is considered etiquette, or netiquette, before you post a question to a newsgroup that you have never been in before, to see whether that question has been asked and answered a hundred times.

Andrew Kantor: Let's say I want to find out James T. Kirk's middle name. I can go to a *Star Trek* newsgroup and post: "Hi, anyone know James T. Kirk's — what the 'T' stands for?" But if I'm smart and polite, what I do is I look for a FAQ file — a list of frequently asked questions. I read through it, and I say, oh, there it is — what is James T. Kirk's middle name. Someone has already asked that. People create these files because the same questions come up over and over and over again.

Eric Berlin: On most of the popular newsgroups somebody who contributes to that newsgroup a lot takes time out of their own day to arrange frequently asked questions into a file, which they post to that newsgroup periodically and also most likely make available on the WorldWide Web. If your question is still not answered, then, by all means, post a question. I guarantee you will have an answer in 24 to 48 hours, tops. Yes, a question in the back.

W: [inaudible]

Eric Berlin: We will show you that in a second.

W: [inaudible]

Andrew Kantor: The *WebCrawler* and *Lycos*.... we're going to talk about finding newsgroups. We are going to talk about the *WebCrawler*, *Lycos*, *Open Text*, and the search engines and how they work because they all work basically the same way.

Lastly, there is electronic mail. When you post to a newsgroup or you look on a Web page and you get information you want, most likely you will find the e-mail address of people who can help you. Maybe you will post a message to UseNet news asking a question, someone will answer it, and then you will have their e-mail address. Then you take it "off-line" rather than in a public newsgroup; you can exchange e-mail because you have got an expert. Maybe you will be on a Web page and you will see a note saying, "An expert on knitting wool is John Smith, jsmithcorp.com." Oh, well, I'll drop him a note and see if maybe he can help me. Of course, you are polite about it — it's like calling a stranger on the phone.

Eric Berlin: I was just going to say... I mean, it's a stranger, so you've got to be...

Andrew Kantor: A lot of people don't want to do that and you'd rather post publicly, which is fine.

Eric Berlin: That is basically what it comes down to, as far as information goes. Let's give a specific example. I want to buy a pair of rollerblades. I don't know the first thing about rollerblades.

Andrew Kantor: But it looks like fun and dangerous, and it annoys my mother, so I want to buy a pair of rollerblades. This is a true story.

Eric Berlin: I am wondering if there are mail-order places on the Web. I'm thinking there must be, but I don't know where they are. I don't know what brand to get. I don't know how much I should expect to spend. I don't know what kind of safety equipment I'll need.

Andrew Kantor: I want to buy a pair of rollerblades, what should do? Before I spend my \$200, do I have to spend \$200? What do I do? So [we turn to] what we said — Web, UseNet, e-mail — in that order. Web and UseNet should be all you need. First thing you do is go onto the Web and search for it. Let us show you. We want rollerblade information.

Eric Berlin: Are we still connected?

Andrew Kantor: Why don't you use the other computer?

Eric Berlin: I certainly will, but I don't know why this keeps knocking me out.

Andrew Kantor: The middle button again? Switch computers.

Eric Berlin: Switching computers...

Andrew Kantor: This isn't supposed to be like this. Any questions in general about this?

M: [inaudible]

Andrew Kantor: I am searching pages on the WorldWide Web; I am using one of these search centers. What do you need?

M: [inaudible]

Andrew Kantor: Yes, the search engines search more than just Home Pages. They search — the good ones search every page on the Web.

M: [inaudible]

Andrew Kantor: Right. With all this stuff, I'm not using my CPU power at all. *Open Text* is a site, a company called Open Text, their site contains a search engine. So what we are doing, we are going to get to *Open Text*. How do you know about *Open Text* — well, you're learning it now. So you should write these addresses: www.opentext.com

Eric Berlin: This is the home of the *Open Text* index. That's precisely what I want. I click on the link and I'm brought right to it.

Andrew Kantor: Simple search.

Eric Berlin: They have a simple search, but they also have a power search where you can search for this term but not that term, or this term, but make sure that this term is mentioned a lot; and this other term only a little. That's a "wadded" search.

M: [inaudible]

Andrew Kantor: You can do Boolean searches. You can do incredibly complex searches. If you go to the top, you notice Video Online has advertised with *Open Text*. *Open Text* has got a great search engine. Lots of people come here, and every time you come to *Open Text*, you can see this little Video Online thing. By the way, if you click on that it brings you to Video Online's page. So it's like interactive advertising. Like our billboard here; if you're looking at one billboard, maybe you can see another billboard instead.

But right now we are interested in searching, so we are going to go back one page, to the general *Open Text* search engine, and we are going to type in rollerblades, also known as in-line skates. We will see what it comes up with. Please work. Ninety pages containing the word rollerblades.

Eric Berlin: Now, *Open Text* puts things in order, it has a scoring system, as you can see here. Let me scroll it up a little bit. A scoring system. This page has the word rollerblade a lot, and so they put it number one. It doesn't [inaudible] what I want, however.

Andrew Kantor: Rollerblade of the Silver Mist.

Eric Berlin: It looks like a work of fiction by John A... Okay, this is not what I want. So...

Andrew Kantor: Summer plans, for the rest, give me a call and join in. Sorry, I can't give you... This looks like somebody, somewhere, is making summer plans and is telling the entire world what their summer plans are. Like I said...

[Tape change]

Andrew Kantor: [This page comes from a] senior in computer science at the University of Illinois. Showing a little bit of the page: "I have many interests, which range from rollerblades to legos." She is a senior in college — what has the education system come to?

Eric Berlin: Hey, look what we have here.

Andrew Kantor: Oh, nice gig. Skate Merchants; New York City in-line skating guide. Skate Merchants.

Eric Berlin: We click on that, that sounds most promising indeed.

Andrew Kantor: New York City In-Line Skating Guide. Oh, so it lists places in New York City that you buy rollerblades, by borough — Manhattan, Brooklyn, Queens, Staten Island. So let's see...oh, and mail order. Mail order.

Eric Berlin: Mail order. Here we have a mail order rollerblade company. Team Paradise. They are in California — not that it matters, because it's mail order.

Andrew Kantor: Now, what just happened? To put it in perspective, we went to *Open Text*, wherever that is. *Open Text* pointed us — we searched on rollerblades — to a page on a computer in New York run by PANIX, which I guess Eric knew about. So we came to that one by PANIX.

Eric Berlin: Oh, no, I really didn't know.

Andrew Kantor: Someone at the New York City Skating Society or whatever put this information up, and it's housed on PANIX, and part of the information they put is a mail-order company that sells rollerblades. So by searching, we ended up from *Open Text* to this page and possibly we can connect to Team Paradise, if we click there.

Eric Berlin: This is a link that will allow us to send e-mail.

Andrew Kantor: We haven't set up...

Eric Berlin: Had we set it up correctly, which we didn't, we could click on this and send e-mail to them and ask for information about their mail-order catalogues.

Andrew Kantor: Send me your catalogue, blah blah blah... Go back to the search on rollerblades. See, when you search on something, you come up with lots and lots of information. I mean, it's easy to use the Internet to search for things, but once you find them, of course, you are finding a lot, a lot of things.

Eric Berlin: Number nine. Here we have a Gopher menu, which we can view with the WorldWide Web browser. Gopher has been folded into the WorldWide Web in this way.

Andrew Kantor: Here we have number ten. Pictures of Tom doing really deadly and sick stunts that haven't been taken yet. Keep going. Anything else?

Eric Berlin: Well, yes, we have more. I mean, I think we got the gist of it here.

Eric Berlin: But I still don't — surfing is the art of getting distracted. Suddenly we are talking about Tom's sick stunts, like I care. I still don't know how much money I should expect to spend. I don't know what kind of safety equipment I want. I think that there is a newsgroup about rollerblading and I hope that they have a FAQ file. I am going to try to find it on the Web. So I am going to search for, not this phrase, but all of these words. I am going to search for a document that has both rollerblades, and FAQ file, and hope that I wind up with the rollerblades FAQ file.

Andrew Kantor: The other thing, of course, is rollerblades is one brand. What we should have searched on, now that we think about it, is in-line skates. In-line with a hyphen, in-line without a hyphen — and that probably would have come up with more pages. So a good deal of that is thinking, what should I search for? And being as specific as possible.

See, we are searching on rollerblades FAQ. Is it coming through? Try that again, try hitting enter, clicking on the box and hitting enter instead. (All the comments I'm making are ending up on the tape and the CD of the show that you can buy, which is kind funny, you can listen to this and have no idea what we're talking about.)

Eric Berlin: There we go — 14 pages containing rollerblades and FAQ.

Andrew Kantor: RSS In-Line FAQ. Now RSS In-line, just from my experience, is probably a newsgroup. The R is probably for .rec, I don't know what the others would be.

Eric Berlin: REC is for skating in line.

Andrew Kantor: The only things that really have FAQ files, or the main things that have FAQ files, are newsgroups, so these two links both point to the RSS In-line. I bet it's REC Sports Skating In-line — RSS In-line FAQ files ports. Now we searched for the word rollerblades, and since this is actually about in-line stuff, it pointed us to the sections that have...

Eric Berlin: Here is the part about where to skate in North America; here is the marketplace, the guide to buying in-line skates. How perfect is that? We click on it.

Andrew Kantor: We could also have used our UseNet newsreader to go to this newsgroup. To search the list of newsgroups that we have, that our provider gives us, search for the word rollerblades, search for the word in-line skates, and come up with a newsgroup, then go to the newsgroup and see if the FAQ file was posted there. But in this case it's also on the Web, and we happen to be on the Web, so we will search it. It's a little faster.

Eric Berlin: That first attempt didn't work; and if for some reason it didn't work, we have backup resources. The FAQ file is posted periodically to the newsgroup as Drew just said. What is this guide? This guide is not review-oriented — see 3.3 for the FAQs for skate reviews. So I can jump over there if I want specifics on that.

Andrew Kantor: Warning: This guide may be offensive to salespeople who pretend they know something about skates when they sell them in stores. Tough nuggies.

Eric Berlin: Here is a checklist for you to print out to take to the store. Whoa.

Andrew Kantor: Now the reason I picked rollerblades is this is exactly what I went through when I was going to buy rollerblades. I thought this was a cool experiment to see if I could use the Internet to buy rollerblades, and it worked out very, very well. So I went through just about everything you are seeing now.

Eric Berlin: Just like Tony [Chen] went through the trouble of making a form for you to fill out for yourself. What type of skating will I want to do? Multipurpose, hockey, speed. Well, multipurpose. What is most important to me? Price, fit, and comfort. He actually has fit and comfort for you. Evidently leaning you in that direction. Deciding on your price range — the crummy skate threshold.

Andrew Kantor: \$130 to \$190.

Eric Berlin: Yeah, middle range.

Andrew Kantor: You also need safety gears.

Eric Berlin: The whole nine yards.

Andrew Kantor: You don't need elbow pads. So this is a case of searching on the Web and you actually find some really good information that someone put up there about getting rollerblades.

Eric Berlin: He goes on and on and on. Very impressive.

Andrew Kantor: Okay, and also a table of contents, other FAQs. Stopping. Well, you can figure out what stopping means, it is probably an important thing to read. Grinding and Vert Jumps, I'm not sure; Slalom, makes sense; Figure Skating, Racing, Buying Guide so you can go... He has put all this information on his Web page. Yes, ma'am.

W: [inaudible]

Andrew Kantor: We are going to do that next.

Eric Berlin: We are going to do that right now.

Andrew Kantor: What we are doing first, as we said, is that we are going from the general to the specific. What we are trying now is to get general information about a subject. In this case rollerblades or in-line skating. We are going to get to the specifics in a second. Right now I want to buy rollerblades, I don't know much about it.

M: [inaudible]

Andrew Kantor: Theoretically correct. I could have gotten to the same place using *Yahoo*. I probably could through *Yahoo*, through sports and recreation, and then skating, and then in-line skating. I could have made my way through *Yahoo* and ended up in the same place. That's very possible. I could use another search engine and ended up in the same place. There are lots of different ways; lots of different places point there. Like I said, we are going from the general to the specific, this is the general, this is I want information about a particular subject — in this case, rollerblades.

Eric Berlin: *Yahoo* has a recreation, there is sports...

Andrew Kantor: If you have only two links — what is called your hot list or your bookmark file — have *Yahoo* and *Open Text*. But not in that order — have *Open Text* then *Yahoo*. *Open Text* is www.opentext.com or rather <http://www.opentext.com>. *Yahoo* is — anyone? — www.yahoo.com.

Eric Berlin: Skating: 94 links.

Andrew Kantor: I'll switch computers here; again, I'm back on my fast computer.

Eric Berlin: In-line skating: 47 different links. Now *Yahoo* does not put every single page that deals with rollerblading out there. So we may not have Amy's little side of the Internet in rollerblading because *Yahoo* just doesn't deem it important enough.

Andrew Kantor: We do have the aggressive in-line skating in Finnish and in English.

Eric Berlin: We don't have Amy — we do have Christine's corner. So after you've done your basic research, you can come back here and pretty well finish up, or fill up your day reading about rollerblading. And if after all that, you still have questions... I'm going to go over to the news.

Andrew Kantor: Okay, then let me explain what actually...again, this is a true story. I got this information, I read through the file you saw and I went out and I was about to buy a pair of rollerblades — what do they call it, Bravo Blades. *Bravo Blade GL*. I'm like, okay, well, this seems to fit everything I have read in the FAQ file, about what to look for in a skate, the price is good, blah, blah, blah, but I don't know about this particular brand. I need specific information that is not in the FAQ file.

We go from the general to the specific. I used UseNet news to get the specific information. I found the newsgroup, I go through the list, and I search on... well, Eric searched on in-line or skating? What did you search on?

Eric Berlin: Skating.

Andrew Kantor: Searched on skating. We have a bunch of rec-sport skating. Ice Figure, Ice Recreational, In-Line, Misc, Racing, Roller. Roller may have been a good one also. But rec-sport skating in-line. I would go to that newsgroup and I would read the messages. You're going to do that now?

Eric Berlin: It's coming in now.

Andrew Kantor: Readers' recent messages. See if anyone mentions Bravo blades, because that's what I was interested in.

Eric Berlin: Let's see if this is actually going to happen - a little *deja vu* occurring here.

Andrew Kantor: Wow. Now, like we said, the FAQ file is often posted to the group, so here it is.

Eric Berlin: [inaudible] it's multi-part.

Andrew Kantor: Stopping, Skidding, Backwards, Stairs, Grinds and Rails. Vert and Jump Slaw, Figure Skating, Racing, Guide To Buying In-Line Skates, which we saw on the Web also. Skate Reviews. I could tell you, I went to skate reviews, the Bravo blades were not reviewed. People have to send in reviews.

Eric Berlin: But nonetheless, that could be a heck of a [inaudible].

Andrew Kantor: That's what I would do. I'm interested in Bravo blades. Okay, I want to buy Bravo blades. First thing — skate reviews. I would go to the skate review thing and see if the specific information I wanted was in there. Why don't you open that?

Eric Berlin: Which heading is that?

Andrew Kantor: Skate reviews. Right there. Okay, it's going to...

Eric Berlin: I'm on the 28.8 modem and it's not just beeping up anymore — it takes a little bit of time. This is more like how your experience is going to be unless you have a lot of money and something to...

Andrew Kantor: So I would look there. I would go through that and I would use the find command and search for the word Bravo. If I saw it and then someone said Bravo blades are wonderful, or the GL is good, but the GLX is not or something like that, I would take that into account. If not, I would post a message to the group, and I'd say...

Eric Berlin: This is a very big file we just tried to upload.

Andrew Kantor: Do you want to stop it?

Eric Berlin: Especially since we know Bravo isn't there, yeah. So I'm going to stop this task.

Andrew Kantor: No, no. Okay, skate reviews, so I would use the find command — different news reviews have different find commands. The [Ejan] has one. Find what? I would search on Bravo. Maybe there is a review there now. This is a review of Aeroblades or something.

Eric Berlin: Aeros.

Andrew Kantor: I understand that Bravo blades are a bit wider. Well, that doesn't tell me much. Rollerblade, Bravo Blade Junior. Well, I'm not interested in smaller skates. Search on it again — here is review of Bravo Blade Junior, the boot, the closure, blah, blah, blah.

Eric Berlin: That was the last one.

Andrew Kantor: Unable to find Bravo. I mean, you get the basic idea. You don't have to go through incredible detail. Okay, that's the information I don't want there; the information I want is not there.

Eric Berlin: Let's see if anybody is talking about it on the newsgroup itself.

Andrew Kantor: I'll search and see if anyone has created a subject header with Bravo in it. Nothing in there. Okay, so no one has asked that — it is not in the FAQ file. I'm not going to offend people by asking a question that's going to be asked a million times.

So I post a message, and I say: Bravo Blade GL, any good? That will be my subject. I post a message to the group and I say I want to buy them, they look pretty good, this is the price, are these decent skates. I post and I wait a couple of days — maybe it's later that day — and people will write back, as they have, and people say, they're very good, except for this, and watch for that and make sure you don't do that. People give me the specific information I want.

So you start with the Web for the general information on this particular subject area, then once you got what you want, you look on the UseNet to see if people are discussing the particular thing you want to know, the particular brand of skates, the particular medical condition you have, the particular bicycle, or particular anything you want to name.

Eric Berlin: Somebody could jump in over the e-mail for a second; if somebody on there, for instance, has Bravo Blades, but you have heard complaints about them, you can send that person e-mail, saying, "But haven't you experienced such and such?" Thus you take the conversation, as you said, "off-line" and now you're using e-mail to further your quest for the blades.

Andrew Kantor: If someone wrote to me, as someone did actually, and said, Bravo Blades suck; and I said, can you tell me exactly how they suck? And he said this buckle doesn't work, and this end had this problem. Someone else wrote to me, and I said, "well, someone told me they suck," and I got into conversations with two people via e-mail about what was good and what was bad about them. I ended up buying them.

Eric Berlin: So now that we have beat this topic to death, let us actually break.

Andrew Kantor: Five minutes leave for our coffee break.

Eric Berlin: While you're out there, think of those things that you want to find yourself. Not just information you want to find, but things that you want to accomplish with the Internet. It doesn't have to be going and buying a product — as a matter of fact, we prefer it not being that.

Andrew Kantor: We've done the buying a product thing. Think of questions you have, tasks you want to do. I mean, this was planned — we searched on this before and we made sure that things would work. Give us something and challenge us, and maybe we will be able to find information. You'd be surprised what is actually out there on the Net.

Eric Berlin: We will also be covering little tips and tricks on how to find the right mail list that you're looking for and other such things. So go and have cup of coffee and come back with lots of challenging things.

[Break]

Andrew Kantor: Everybody back? Is anybody not here? We just had a question: What is the difference between a Web site and a Home Page? A Web site, an organization's Web site is going to contain possibly several pages.

In Yahoo's case there are dozens and dozens of pages, but a site can contain several pages. The first page you come to — Ragu, we went to www.ragu.com — that first page is considered the Home Page. Then there are other pages underneath it on Ragu's Web site. So I talk about what's on my magazine's Web site; it could be on the Home Page, or it could be somewhere in there. It's kind like the Web site is the neighborhood and then we talk through individual buildings.

W: [inaudible]

Andrew Kantor: If you wanted to package a basic set of tools, of Internet tools, I only use Windows — unfortunately, for you. But for Windows, I would get *Internet in a Box* because I think they have the best dialer around. *Chameleon* comes free with a lot of things. I hate *Chameleon's* dialer, although *Chameleon* is a powerful package. I would get *Internet in a Box's* dialer.

For e-mail, I would use *Eudora*, which is available from a company called Qualcomm. They are here somewhere at the show.

For UseNet news, I would use Forte's agent — a freeware version called *Free Agent* is available. I don't think Forte is here. But Forte's agent. I don't know if you could buy that in the stores either. I know you can contact them at www.forteinc.com for the UseNet newsreader.

For the WorldWide Web, there is no contest. *Netscape* is the only way to go. *Netscape* can do things the others can't. *Netscape* is free on the Web at www.netscape.com — you can download it. Also, *Netscape* is here and you can buy a registered version of their browser.

What else is there? That's basically it. You don't need a separate FTP application — although you can get that — because *Netscape* does FTP, *Netscape* does Gopher.

So I would say *Eudora*, *Agent*, and *Netscape*. Plus a dialer, and *Internet in the Box* is the best dialer. If you have a direct connection from your office and you don't need a dialer like I do, then just get those three products. There are freeware versions of all of them or you can pay a little money and get the commercial version. They're just absolutely terrific.

M: What was the dialer [inaudible]?

Andrew Kantor: The dialer actually dials your Internet provider, dials your modem and connects you to the provider and negotiates. It says, "Hi. I'm establishing an Internet connection — okay, you're ready, I'm ready" and it connects you and then lets you use all the applications.

Eric Berlin: This is my dialer. It's when I click on my dialer...

Andrew Kantor: Can you clear the screen because it looks — go to view.

Eric Berlin: Clear the screen?

Andrew Kantor: Edit, try edit. Clear window. Okay. This is his dialer.

Eric Berlin: And what will happen when I connect... Well, that didn't work.

Andrew Kantor: Yet you listened to me when I gave you those instructions. This is the dialer that comes with *Internet in a Box*, and you can set up different configurations. If you're calling from different places, if you have different phone numbers, all you have to do... basically, the only buttons you need to worry about are dial and hang up.

CompuServe will give you this, a version of this for free, which will only work with CompuServe's connection — but CompuServe isn't a bad Internet provider — and it only has dial and hang up. It lets you configure things in other places. Can you go to network, can you show that configuration? We're on-line, aren't we?

Eric Berlin: Okay, so we can't do the setup. We can show you later. *Internet in a Box* is a very simple dialer. I mean, four buttons and two of which you use... *Chameleon's* is more complicated, but other companies, well, any Internet software is going to be fairly easy to set up. It doesn't matter, once you're connected, then it's just pick the tools, pick *Eudora*, *Agent*, and *Netscape*. Yes.

W: [inaudible]

Andrew Kantor: Why doesn't *Netscape* have a dialer built-in? *Netscape* now has what's called *Netscape Navigator Personal Edition*, where they bought someone's dialer and packaged it. They also package the freeware version of *Eudora*, so you get *Eudora* and *Netscape* and a dialer. I don't know, maybe they just didn't bother to do the programming, so they bought someone else's. They package it with it. So if you go to the *Netscape* booth, you can buy the personal edition, which includes a dialer.

Eric Berlin: You can, in fact, read newsgroups with *Netscape* but it's not very attractive. It's better to go through a program specialized for UseNet news. So *Netscape* thought, well, you can read news, figuring *Netscape* and *Eudora* is all you need, and that's why it did that. But without a newsreader...

Andrew Kantor: You won't UseNet news.

W: [inaudible]

Andrew Kantor: You can send e-mail if...well, the new version of *Netscape* is supposed to do e-mail, it doesn't do it very well, and with *Netscape*, if you come to a Web page that has an e-mail link built-in, like mine, if you click there, it says, "Send me e-mail" and you click there and then *Netscape* will let you send e-mail.

Eric Berlin: You can't receive e-mail.

Andrew Kantor: Yeah, you can't receive e-mail with *Netscape*.

W: [inaudible]

Andrew Kantor: The question is a comment on how we read news on UseNet. When we say news, UseNet news is simply what it's called. It's not exactly UPI and it's not news like you would find in a newspaper. It's simply a bunch of messages that people are leaving for one another. It's a bulletin board system, it is not the daily news.

Andrew Kantor: I have a few newsgroups that I follow every day, and I go check it — just news about the Internet and some other general stuff that I look at every day, see what new news is up there. If there are any that are interesting, if anyone talks about the magazine or something, I reply to it. So every day I check three or four newsgroups, see if there are messages I'm interested in, discussions I want to get into.

Eric Berlin: Why don't we make that our first thing: How do you find actual news items on the Internet? Do you want to do that?

Andrew Kantor: Actually I know some people have questions, so why don't we do that later. There are companies that will send you e-mail periodically, that sell AP; they have an AP news feeder or a UPI news feed. There is a company called Farcast — I'm not sure where they are based — but Farcast you subscribe and then AP news is periodically sent to you. I get it every two hours, I get the latest AP news. If a big news break comes in, they'll send it to me immediately. I can search the AP news feed, and Reuters, and UPI also.

That's one way I get actually real news through the Internet. So I don't have to go home and watch TV and have my mind sucked out of my head, I just read the AP news as it comes

through. If there is something interesting, I can search all of AP news for a term. So if you search on Bosnia, it will say here are articles on Bosnia in the past year.

W: [inaudible]

Andrew Kantor: Question about tools, okay. The question is, is there a provider that gives you reasonable tools. Now I don't know if you're mixing up providers...

W: [inaudible]

Andrew Kantor: Is there a software company that gives you the reasonable tools for everything? *Internet in a Box's* tools are very good. They are not the best you can get. Wollongong makes a product called *Emissary*. *Emissary* also has very good products. Actually all of them, like Quarterdeck's *Internet Suite*. They're all good.

In other words, you're not going to buy a commercial product nowadays and go, "yuck." It's very unlikely you're going to go, yuck. But there are better things than what they've got. So if you just want to buy, and you don't want to worry about searching for other stuff, you just want to get it, any of these products is going to be good.

Spry e-mail, which comes with *Internet in a Box*, is a decent program, it's not bad at all. You'll use it and you'll be happy. It's only that once you've used *Eudora*, then you say, "oh, wow, this is much better."

M: [inaudible]

Andrew Kantor: Some service providers will sell you for a buck an entire suite of software, but first of all make sure it's a suite you like. Read the reviews in the magazine, or just see if they demonstrate it to see if you like it.

Many providers, as I mentioned before, will offer software, they will give you a freeware package they've put together, they'll help you set it up. That's a very good way of getting software, without actually paying for it or downloading it.

Some providers will give you commercial software; they make a deal with a company and they say, sign up with us and we will give you the free software. It's kind of like buying your cellular phone — you sign up for cellular phone service and we'll give you the telephone for free. It's kind of like signing up with our access service and we will give you the software. That's the way a lot providers do it. It's another way to get software.

(What did you do? Why don't you just put on never hang up. Why don't you just click on...?)

Eric Berlin: No, I think seven hours should cover it.

Andrew Kantor: If it doesn't, we're all in big trouble.

Eric Berlin: There was a man here who wanted to know about finding government information.

Andrew Kantor: There he is. Okay, why don't we start with that. We're looking at different ways to find...

M: [inaudible]

Andrew Kantor: Should we make an example?

Eric Berlin: Or you can tell us a real one.

Andrew Kantor: See we have to repeat every question, because this is being taped, so we have to repeat everything into the microphone.

M: [inaudible]

Andrew Kantor: You're interested in doing some research on crashworthiness of vehicles.

M: [inaudible]

Andrew Kantor: You're a lawyer, right? I'm sorry. Obligatory, I had to do that. Okay: crash-test worthiness.

M: [inaudible]

Andrew Kantor: We're looking for highway crash [statistics] on cars; okay, stop, we don't have to put every term in here. Let's see if we can find anything on that. You don't want to be so specific.

Do we have anything on this? This is a thing I might do, and this is a tip — if you give me the acronym again, I might search www.thatacronym.gov. Let's see if *Open Text* finds it. (I really would like to use the other computer for this, the faster one.)

Eric Berlin: It's better not to switch back and forth. We have the news feed on this one. Assuming we are going to need the news people. We're getting something — we're getting a lot.

Andrew Kantor: There is an alternative to the plain old phone line. The alternative is called ISDN. I don't know if you've heard of this — Integrated Services Digital Network. That gives you an incredibly fast connection, a digital connection; instead of a 28.8 modem, it's the equivalent of 128 kilobits per second, instead of 28 kilobits per second.

A lot of phone Internet providers support it; most phone companies charge about the same rate as a telephone service to install it and to hook you up. ISDN is sweeping the country, slowly, but still sweeping the country. Hopefully, everyone will soon have that kind of connection, or maybe a connection through your cable TV.

Everyone now wants to get into the Internet business. There is company upstairs called Direct PC which gives you a satellite dish and gives you a satellite connection, which is really, really fast.

Okay, we searched on national highway traffic; we found 65 pages. That's good: it's not too much, it's not too little. The first one is a Gopher menu.

Eric Berlin: Let's see what it has here.

Andrew Kantor: DOT phone directory — Department of Transportation.

Eric Berlin: National Highway Traffic Safety, Administration Information, Office of INS.

Andrew Kantor: Office of Inspector General.

Eric Berlin: Now, say that *Open Text* allows you to do, which is wonderful, is that you can see the matches on the page without necessarily going there. So if you just blip over there to see where it matches up and then you can just come right back, and say, "okay, that wasn't it. Let's move on."

Andrew Kantor: *Open Text* index. Oh, there is no punctuation, which is a problem. National Highway Safety and Information.

Eric Berlin: Well, that sure didn't...

Andrew Kantor: Go back and go to the page; go to the Gopher menu. Now remember I mentioned that Gopher is just a list of menus, just a list of text. Now *Netscape*, which lets you see the Web, also lets you see Gopher, the Gopher menu. See, it's just a list.

Eric Berlin: Okay, Department of Transportation phone directory; General Dial Information; New Announcements; Federal Aviation Administration; National Highway Traffic Safety Information. Now let's see what they have. Server return, no data.

M: [inaudible]

Andrew Kantor: They are union, it's break time. Okay, I want to look up and I... Stop.

Eric Berlin: [inaudible]

Andrew Kantor: I look up and I see... now notice that Web addresses start with `http://`. This starts with `gopher://` — it's a Gopher menu. Just for the heck of it, I would delete that Gopher and make it `http`, or try instead of `gopher.dot.`, I'd make it `www`. And I'd get rid of that one on the end. Let's see if the DOT has a page.

Eric Berlin: The U.S. Department of Transportation.

Andrew Kantor: Well, they also have a Web page, so if you find a Gopher menu, look at the address, and substitute `www`.

Welcome to the DOT WWW server. Our government just loves acronyms. That's the symbol for the Klingon Empire. It is!

Eric Berlin: Now if you are on a dial-up connection and you want to find your information, and you don't care what the Department of Transportation's logo looks like, you could just hit stop.

Andrew Kantor: See, I've had a call from a magazine called *Log-Out*, which is the humor page, and I've looked for stuff like this. So I just got my next column.

Eric Berlin: Here, where the pictures would have loaded in...had we allowed them to load in... But we don't want that, we just want the information.

Andrew Kantor: Text links, DOT General Information, blah blah blah, Browse General Information. Useful Internet Sites, Dot Talk, Help, What's New. You've reached the Home Page

for the U.S. Department of Transportation WorldWide Web server. This server is still under construction, and new sections are being added on a continuing basis. Now if I wasn't sitting here in front of an audience of — how ever many — 60 people, I'd be going through this stuff a lot faster in terms of search.

Okay, this isn't what I want. I go back, search something else. So although it seems to take long here, in real life it's not quite as bad.

Eric Berlin: Browsing the DOT administration, just to see if there is anything there. Maybe there is even a little search engine.

Andrew Kantor: Switch to the other machine so we can get through this faster.

Eric Berlin: Hang on a second. In the middle of this, it's not the easiest things to do. Now it's interesting that the U.S. Department of Transportation has a picture of the Concord, which is a British and French plane. I just want to point that out. Okay, National Highway Traffic Safety Information.

Eric Berlin: We're going to get... "Data Not..." or whatever, again.

Andrew Kantor: Probably not.

Eric Berlin: Oh, there we go; it's www this time.

Andrew Kantor: Now there is also a text version of this site.

Eric Berlin: Let's go to it.

Andrew Kantor: This means schmucks like us who are using a [dial-up] connection can go, okay, this is what you wanted. National Highway Transportation and Safety information.

Eric Berlin: Here is a library.

Andrew Kantor: Right, we don't care about the administrator's message. We don't care about them because we know what they are. We want to know what's in their library, so we click on that. So you get the idea — this is how we're searching for information. What we'll find, I don't know.

Eric Berlin: Traffic safety facts.

Andrew Kantor: Research and development, safety, insurance, media information, consumer information, recall and defect information, general information. Are we getting in the right direction here?

Eric Berlin: What is consumer?

Andrew Kantor: No, we're not going to do all your work for you.

M: [inaudible]

Andrew Kantor: Well, hopefully this will be faster because you don't have to deal with human beings.

M: [inaudible]

Andrew Kantor: Slow down. Highway Safety Programs, Strategic Planning, Improvement. Keep going.

Eric Berlin: We not only found the organization — I forgot what the specific question was.

M: It doesn't really matter.

Eric Berlin: Crashworthiness of cars.

Andrew Kantor: Wouldn't Ralph Nader have something like that in his site?

M: [inaudible]

Eric Berlin: Well, let's give Safety Assurance a shot. We could go through all these at length. I have a funny feeling, we'll find exactly what you're looking for. I took an educated guess. Safety Assurance. Let's see, what do we want.

Andrew Kantor: We don't want to spend too much time on each individual thing.

Eric Berlin: You get the basic idea. Here we didn't even need to go to UseNet news and ask around.

M: [inaudible]

Eric Berlin: Video, we wouldn't even bother with. Not on a dialogue.

Andrew Kantor: With a direction, Video is great. It's really cool, you can see in sounds, you can hear sounds in the real time, you can listen to the World Series broadcast in real time over the Internet. Actually, you can do that with the dial-out connection, too.

Eric Berlin: With the NetSearch, we'll just go back over there.

Andrew Kantor: This page lists the contents of the available National Highway Safety Administration, database file.

Eric Berlin: This is a raw data. They say in bold, "No search engine is being provided with this data."

Andrew Kantor: Go back. All these files are available for downloading across the Net, so double-click the database name to go to the directory which contains the compressed files. You can download these files to your computer instead of viewing them over the Web. Let's say you're paying, you're going through a provider that charges you per hour, just download it and then view it locally.

M: [inaudible]

Andrew Kantor: We can capture this, we can mail ourselves this document, we can capture this file if you want.

M: [inaudible]

Andrew Kantor: We can't capture every single link and everything that's underneath it because that could be huge amounts of things. But we can do a page.

Eric Berlin: Technical service bulletins, that database — those are two main files.

Andrew Kantor: I think generally we have a good idea.

Eric Berlin: We set you on your way here.

Andrew Kantor: It takes some time. Let's find something else. Someone over here had something.

W: [inaudible]

Andrew Kantor: Finding a job teaching in Italia, particularly Milan, particularly in the northeast end of Milan, and I want to have an apartment on the third floor. Go home. Ah, you want to do *Open Text* — we like the *Open Text* engine best.

I was telling someone before — was I telling everybody? I don't remember. If you only have two... (We have a thing, show the bookmarks for a second.) These are bookmarks you can create, right now there is one bookmark, Ryan Whitney's Home Page. These are places you go frequently, so you don't have to type in the home address. If you only have two bookmarks, you should have, in order, www.opentext.com and www.yahoo.com. Those are the two best things about finding things on the Web. *Yahoo* for browsing, *Open Text* for searching.

Eric Berlin: Let's go to country, [inaudible] just text; see what *Yahoo* has.

Andrew Kantor: I'd rather do teaching, Italy, English. I'd rather do a search on that. My first thought was to go to *Open Text* and search on the words, teaching, English, and Italy.

Eric Berlin: All right.

Andrew Kantor: Talk about laziness. If you are willing to program a little and you learn HTML, my Home Page has this thing built right into it, so I don't have to actually go to the *Open Text* page.

Eric Berlin: Actually we're going to do things a little bit differently here. A simple search isn't going to cut it, I'm going to do a power search. In the first box I'm going to put: Teaching English.

Andrew Kantor: One word at a time. Italy.

Eric Berlin: And over here Italy and/or Milan/. Let's see what we wind up with by hitting search. If you know Boolean logic, if you want to go through the ands and the ors, you can get a really complicated search. Well, we found 4,546 pages.

Andrew Kantor: Wait. AGU Home Page. What is the AGU? Do you know what the AGU is? Okay, let's go down a little, let's see what we have. There is a fall meeting program — something in Italy, in Italian. Italy, Milano.

Eric Berlin: Let's see what the matches are, because it should say [inaudible]

Andrew Kantor: So it's trying to tell you — it's in Italian. How good is your Italian?

W: Not good.

Andrew Kantor: Well, that's going to change. Okay, forget it. This is all in Italian. This may actually help us, but we will never know.

Eric Berlin: This is exactly what we need.

Andrew Kantor: If anyone speaks Italian and wants to come and translate this, we can do that. Like I said, Internet is mostly in English, but some of these countries just aren't in line yet. We thought we taught them a lesson in '45.

Eric Berlin: We need to narrow this search. How might we do that?

Andrew Kantor: I think you should do a simple search. Actually, I think you should go to the first link on that page.

Eric Berlin: Well, that didn't look very promising at all.

Andrew Kantor: What? It looked like there was an organization that helps people find teaching positions. This is what I would do...

Eric Berlin: Search on English as a second language.

Andrew Kantor: EGU Home Page. What is the EGU? Who knows what that is? It could be an organization that helps you teach, helps you find teaching job.

It's .org, so it's a nonprofit organization. International schools. There are a lot of things. We ought to start to think of the search term. What search term would you use? International school is teaching, but she wants something very specific: Milan, teaching, English. But International Schools...lick on stop.

M: [inaudible]

Andrew Kantor: Yes. I think it should be teaching, Italy, Milan, in there. Teaching English as a second language. Why don't we just do ESL?

Eric Berlin: What?

Andrew Kantor: That's going to find you programs all over the U.S. because it an American [inaudible]

Eric Berlin: Well, that's what the power search is for — then English as a second language, and then Italy. Stop whatever you're doing.

Andrew Kantor: Step away from the speaker.

Eric Berlin: So we can search for the phrase, and we're not restricted by this box. English as a second language.

Andrew Kantor: Italy.

Eric Berlin: Meanwhile, I have mail. Well, this is more promising — 59 pages.

Andrew Kantor: University of Arizona, Center of English as a second language.

Eric Berlin : Center for English as Second Language.

Andrew Kantor: Go back. Milan is important.

Eric Berlin: Okay.

Andrew Kantor: Too many cooks.

Eric Berlin: Milan, really I typed it, you just can't see it. There you go.

Andrew Kantor: Search. Now, English as a second language may be a particular thing in American schools and other schools may not call it English as a second language. So we don't know.

Eric Berlin: Eleven pages.

Andrew Kantor: This looks like it's German, because these words are huge. [Cortenhurchdoing... Unterhirschmittel...]

Eric Berlin: Well, we found the FAQ for a... What's that? Social culture Italian FAQ.

Andrew Kantor: Social culture Italian FAQ. Now, here we go to see UseNet news.

Eric Berlin: Science economy research.

Andrew Kantor: You want to teach in South Africa instead, would that be okay?

Eric Berlin: Well, let's go to the FAQ file. I wanted to see what the link was before I went somewhere. Where did that FAQ file go?

Andrew Kantor: Again, in real life this would be a much faster thing and we wouldn't be boring you by going through this and looking at every link. I would look, go right to the first couple links.

M: [inaudible]

Andrew Kantor: Yes, we searched on Milan.

M: [inaudible]

Andrew Kantor: Yes, if it's contained in there, it will be in there.

Eric Berlin: We can search for teaching.

Andrew Kantor: Teaching.

Eric Berlin: English.

Andrew Kantor: Just teaching, why be so specific?

Eric Berlin: Because I already started it.

Andrew Kantor: Search on teach.

Eric Berlin: Oops. Hey, it lied to us. How can this be? Is this still coming in? No. Weird. It doesn't make any sense.

Andrew Kantor: Okay.

Eric Berlin: I don't understand.

Andrew Kantor: All right, let me get in there.

Eric Berlin: Arrrrr, now it will find it.

Andrew Kantor: I'm getting frustrated.

Eric Berlin: What are we on here: teaching, and English, and Italy, and Milan. Science Economy Research keeps coming up.

Andrew Kantor: Now here is a directory of faculty involved with international research and education. Now this may link me to someone who does teaching in Italy, and there maybe an e-mail of someone I can write to at Emory University.

Eric Berlin: The FAQ file for social culture Italian was in eight parts. It said eight of eight. That means the FAQ file is pretty darn big. We might want to look for the entire FAQ and see if it's not in that section where it is. We might want to go to the newsgroup: Social Culture Italian.

Andrew Kantor: English, English literature. Oh, no — crash. We have the BETA version they installed on this machine.

Eric Berlin: Did you hear what I just said about going to the newsgroup? Social Culture Italian. Sometimes it takes a while.

M: [inaudible]

Eric Berlin: Oh, he is in charge. Have you not noticed that?

Andrew Kantor: I've got the word "editor" in my title.

Eric Berlin: Beg your pardon.

W: [inaudible]

Andrew Kantor: These are still connected.

Eric Berlin: It should be connected. Oh, no, this is connected; it's just not plugged into that screen.

Andrew Kantor: Okay, we're going to search on a newsgroup: Social Culture Italian.

Eric Berlin: All right, it's got 915 headers, because I have never looked at this newsgroup before. So this is going to take a short bit. Actually, the rest of the FAQ should be...if the eighth part of the FAQ is on the WorldWide Web, odds are the other seven were there as well.

Andrew Kantor: We will see it when we go back the Web on this machine, is that what you are saying?

Eric Berlin: I'm making suggestions here. One small problem with Social Culture Italian is that it's in Italian.

Andrew Kantor: I'm going to look to try to find "teach."

W: [inaudible]

Eric Berlin: It's under edit, and then find. But we know there is keyboard shortcut — Control-F. We've got it down to a science.

Andrew Kantor: How do you say teach in Italian?

M: [inaudible]

Eric Berlin: That's not Italian, that's Spanish. Now everybody here speaks Italian.

Andrew Kantor: Let me go back.

Eric Berlin: This is most aggravating.

Andrew Kantor: The thing is you have to a good attention span; you have to go through each of these things one at a time and look.

Eric Berlin: Did you say that you actually speak Italian? Do you speak Italian? You don't speak Italian. So the search with that newsgroup will be of no use to you whatsoever. Which, of course, means that's where the answer is.

Andrew Kantor: Actually that's a name, I see Milan. That's someone's name, so it's not the Milan we want.

Eric Berlin: No, especially... he is a poet, evidently. What?

M: [inaudible]

Eric Berlin: Stop, stop, planned languages, excluding Esperanto. What is a planned language?

Andrew Kantor: It's probably languages they're planning to teach.

Eric Berlin: All right, so the one for one, is basically what it comes down. I mean, one for two.

Andrew Kantor: [inaudible]

Eric Berlin: I'm not sure job will do it, anymore than looking for a job to teach in Italy. Yeah, that's probably part of Gutenberg, which attempts to put every great piece of work [on-line].

Andrew Kantor: Achtung, Gutenberg.

Eric Berlin: Oh, really?

W: [inaudible]

Andrew Kantor: Oh, yes, we could.

Eric Berlin: How about North Milan?

M: [inaudible]

Eric Berlin: It's at all of those words, not necessarily in that order. Is that an orchard? Do it on a simple search. Yes?

W: [inaudible]

Eric Berlin: Teaching English abroad. I think that we're going to give up in about a second and move on to something else.

Andrew Kantor: Well, I would. Okay, so we go through this, we get to the point of being frustrated, we're not finding anything, what do we do? We go to the Social Culture Italian newsgroup and we say...first we go through and we take the time to load that long list of files in there, to look at the FAQ file.

Eric Berlin: We see it's in Italian; it's of no use to us.

Andrew Kantor: Not necessarily, if we [inaudible], we can throw it out. If not, chances are it's not going to be in English. We post a message, if we don't have the questions and answers: "Hi, I'm interested in teaching opportunities in Milan. Teaching English in Milan. Do you know...?"

So it's going from the general [to the specific]. If you can't find anything general about teaching English in Milan, you go to the specific UseNet news, and you post a message.

Eric Berlin: Even though we can't speak Italian, we're pretty sure that the people who read that newsgroup can speak English, at least somewhat. That will probably get an answer. "Looking for work? Try the World."

[Tape change]

Eric Berlin: ...post to Social culture Italian. We're not going to have enough time. So that's what we would do, if we had the time to do that. Then once you get yourself connected to the Net next week, that's what we recommend that you. It's time to let it go.

Andrew Kantor: I'm going to be yelled at for not using the microphone. Something else?

M: Starting a lottery in Belize.

Eric Berlin: Starting a lottery in Belize; you want to compete with the one in Liechtenstein. Oh boy, starting one? So therefore we need U.S. regulations.

Andrew Kantor: Okay, go to *Open Text*.

Eric Berlin: So what we want there are Internet servers.

Andrew Kantor: The thing is starting a lottery in Belize, there is no...it's not a good question. It's like how do I start a lottery in Belize? It's like how do I buy a house? There is too much information there. You have to find out exactly what you want to do. Who asked the question?

Eric Berlin: But we know who you have to ask the information too, and that is an Internet access provider in Belize.

Andrew Kantor: That's one thing to look for. Well, you don't necessarily need an access provider in Belize. The question is too general, that's the problem. It's like, well, what do you have to do to start a lottery? You want to find out, what do you need to do to start a lottery? What are the laws involved? It's something more than we could do in the next five minutes. It's too involved.

Eric Berlin: No, we still have time.

Andrew Kantor: Yes.

M: I'd like to know from the list of magazines published in the United States any with the word natural in the title.

Andrew Kantor: A list of magazines with the word natural in the title, that's easy.

Eric Berlin: Yeah. Magazine and natural on *Open Text*.

Andrew Kantor: I would go to *Yahoo* and I would search on... Entertainment magazines, let's see, do you want Magazines On Electronics; you want a list of every magazine. In that case, this is not going to work because there are going to be a million pages. Right?

Eric Berlin: What do you need, titles or...?

Andrew Kantor: You need to find a list of [magazines] which have some media on the Internet.

Eric Berlin: What follows is a list of newspapers and other mass media which have some outlets on the Internet. Natural born killjoy. There is an organization on the Internet, the electronic newsstand, you sort of link for — it briefly flashed by. They have agreements with various magazines to sell subscriptions through their server. I think you actually sample some things. We can go here — electronic newsstand. At least, see what's there as a start. Because they are expanding every day; they've got a lot of magazines under their heading.

M: What if you push title and you search for words?

Eric Berlin: It probably wouldn't be under titles.

Andrew Kantor: What you want to do is find a list of magazines, and then search those lists of magazines for the word "natural."

Eric Berlin: MagNet, that's kind of cute.

Andrew Kantor: Magazine titles alphabetically.

Eric Berlin: They are not natural looking — though it's going to be the first word, unfortunately.

Andrew Kantor: Right, so it's tough.

Eric Berlin: Wait, we just searched this under title to start; you can search this whole thing for the word natural.

Andrew Kantor: So they have all of them right here... So. natural help, that's it?

Eric Berlin: Natural help, there you have it. Next question.

Andrew Kantor: This is not every magazine in the world.

Eric Berlin: Obviously not. What you should do is try different resources. MagNet gives you this one — Electronic Newsstand. Try Electronic Newsstand.

Andrew Kantor: Now I could search on Electronic Newsstand and try to find... I know from memory that it's www.eneews.com. I could go to *Open Text*, search on Electronic Newsstand, and it would give me a lengthy list. The Electronic Newsstand. Clicked on it.

Eric Berlin: And they do it because so few people... most people subscribe to magazines the old-fashioned way. You can actually get good bargains on the Electronic Newsstand. You can probably get a better price sometimes.

Andrew Kantor: This will take some time to come in.

Eric Berlin: There is the whole list.

Andrew Kantor: From [*Agnia*] to *Yoga Journal*. Well, that's interesting, nothing has the word natural in it.

Eric Berlin: Are you certain that there are magazines that have the word natural in it?

M: Next question.

Andrew Kantor: Yeah, next question. Give us something specific that you want to do, as opposed to this bit of information you want to find.

W: [inaudible]

Eric Berlin: A list of all the domain names?

Andrew Kantor: What you can do... There is an Internet command called "who is" — it's a UNIX command. The best thing is to ask someone who knows UNIX, and you can do a "who is" search on any name you want. So you can do: Who is andrew.com, and it will tell you if it's not registered, it will say, "no matches to this name."

W: [inaudible]

Andrew Kantor: You can call the InterNIC or try to get in touch with them and see if they'll send it to you, but it's so huge.

W: [inaudible]

Andrew Kantor: It's probably out there. I guess we could search for it.

Eric Berlin: Yes. InterNIC has a Web site, but I don't know if they have... it's more like how to register and it's not a list of domain names. I'm sure there is a list out there, but it's easier if people just do a "who is" to find out if something is registered or not.

W: [inaudible]

Andrew Kantor: Yeah, if it is registered. If "who is" finds it, then you can't use it. It may not be in use yet. But if they find it, you can't use it.

Eric Berlin: Any questions?

M: Is there a Web site for dragging down different [inaudible]?

Eric Berlin: Yes, there is.

Andrew Kantor: Yes, there definitely is. I avoid plurals as much as possible. Because it gives me better search results. So I search on missing person. There may be a magazine called missing person, or a movie, or a book, or something like that that I might find. What we are trying to get you to get out of all this is that searching on the Internet, it's not perfect, and sometimes you are going to find a million links to something and none will be what you want. In which case there is always UseNet news — post on it and ask a question in the appropriate newsgroup.

Eric Berlin: There is a hierarchy. We talk about the hierarchies on UseNet news. There is the "alt" hierarchy, which is just sort of random, weird newsgroup, etc. There is one hierarchy called news, which is a very important hierarchy for the beginner. There is news.lists, which has periodically a list of every publicly available mailing list that you can join. That's a very important resource. There is news.new users questions, which is the place to go to ask a question about using UseNet news.

A lot "newbies," as they are called, simply post, How do I do such and such, in the very first newsgroup alphabetically. As a matter of fact, they set up a few bogus newsgroups at the very, very top of that list in order to catch such things. But the place for questions, the place where you are going to get polite answers as opposed to pained e-mail, is news.new, user's questions.

Andrew Kantor: It's in Elements, it's in there under UseNet news, you'll see it there. I went to one page, by the way, as you see. Currently missing, Morgan Nick. Well, assuming that there are more people missing in the country than Morgan Nick at this point... could be homeless, missing persons project. That's why it's hit or miss.

Eric Berlin: There are several missing person pages, even if they don't all link up to one another. Almost in Paradise. Almost in Paradise, but he has a computer in a Web page.

Andrew Kantor: Yeah, he is using Santa Monica's public electronic network. Let's try, missing persons, following [inaudible] prominent missing person cases, investigations with Halifax Police Department.

Eric Berlin: This is the unofficial Home Page of the Homeless and Missing Persons Network, a subgroup of a National [inaudible] and the Mentally Ill.

Andrew Kantor: You can search on anything, this is what it comes down to. Searching for stuff on the Internet — it's the same pattern. Start with the Web, start with *Open Text* or *Yahoo*, or *Lycos*, or *WebCrawler*, or one of these search engines. Look for general information on a subject, see if it's there. If it is not there, look in UseNet news, see if it's discussed in the appropriate newsgroup. If you go to that list of newsgroups...but you are not going to let me do it, are you?

Eric Berlin: What?

Andrew Kantor: You are not going to let me go to that list of newsgroups; we have to switch to the other computer?

Eric Berlin: Switch to the other computer; it takes a second and a half.

Andrew Kantor: Then I go to this list here — groups, all groups, okay. I wonder if there is a missing persons newsgroup?

W: [inaudible]

Eric Berlin: The FAQ file... They are posted periodically to the newsgroup in question. Most of them, if not all of them, are on the Web. So just as I searched on rollerblading and FAQ, I was taken right to the rollerblading FAQ.

M: [inaudible]

Eric Berlin: Some of the larger ones have many, many parts. You saw that that rollerblading FAQ was about 13 different parts, so you might wind up with different menu entries for different sections. But in general, yes, you just get taken right to it. Assuming, of course, that it exists in the first place and is on the Web.

Andrew Kantor: So, there is all missing adults; request information has searchers on a lost love — “looking for Babs from Nigeria.” So people are talking about missing people.

Now this is this family’s book about where they are getting the guy’s social security number and stuff like that. It appeared in this newsgroup: alt.missing kids.

Eric Berlin: Did we not post to a newsgroup?

Andrew Kantor: Posting is easy.

Eric Berlin: No, we did not.

Andrew Kantor: I used one of the test newsgroups.

Eric Berlin: We sort of filled alt.missing kids automatically, because that’s the newsgroup we were reading.

Andrew Kantor: I [inaudible] e-mail.

Eric Berlin: I say ignore this test or I’m going to get barraged with e-mail. Here is the subject header. I’m going to get 70 zillion e-mail messages now.

Andrew Kantor: Well, what will happen is you will get messages from computers all over the world saying, got your test, got your test, got your test. Yes, you need a news feed, you need Agent or some newsreader which will give you the list of newsgroups that are out there. Then you can go through this list. In this case *Free Agent* makes it easy. I click on groups, other things — it is like list of all newsgroups. Do you have a newsreader on this thing?

Eric Berlin: Yes I do, as a matter of fact.

Andrew Kantor: Something very bad has happened.

Eric Berlin: No, I just go down to the bottom. Go down, move all the way to the bottom. There we go. No, it’s Start Programs — I know where it is.

Andrew Kantor: Why don't you tell me.

Eric Berlin: Now we have a brief introduction to Windows 95. This is the browser.

Andrew Kantor: Spry's newsreader, which isn't bad.

Eric Berlin: Oh, it's not configured for PANIX.

Andrew Kantor: So Spry has the newsgroup browser. Same thing.

Eric Berlin: It's lots and lots and lots of newsgroups.

Andrew Kantor: So here I have my list of all groups. Whatever I'm interested in... you know, if it's Italian, I can search on that — Social Culture Italian. See if there is anything else. Trial [inaudible] — I guess this is a trial newsgroup. Just those two.

So whatever you want, you can search through your UseNet newsgroup list. Different UseNet software, different UseNet programs will give you different ways of searching through a list of all the groups. But you can do that. The important thing in searching the Internet... Just remember, think this mantra — search the Web for general, UseNet for particular — just over and over again.

Then through those two you might find e-mail addresses of people to write to, if you are interested in keeping up with a subject, like other people who are teaching Italian in Milan. You're supposed to look up...there you go. Other people, you can find maybe a mailing list; and elements gives you instructions on getting a list of mailing lists.

But maybe there is a mailing list on other people who are teaching abroad, and you want to get involved with them and exchange messages with them. One nice thing about a mailing list as opposed to UseNet news, although they tend to be smaller, is on UseNet anybody can post anything they want to the newsgroup. Mailing lists, if you post things inappropriately, they will take you off the list. So mailing lists tend to be more on subject than UseNet news. UseNet news has a lot of noise with it. All right, let's go back now. There is question here.

M: [inaudible]

Andrew Kantor: What do you mean, charged for the services that we're looking at?

M: [inaudible]

Andrew Kantor: Can you be charged for something without knowing it.

Eric Berlin: Not without knowing it, no.

Andrew Kantor: They have no way to bill you. If you go to a store, you want to buy something, you are going to have to enter in your credit card number. If you are going to sign up for a service, you are going to send them your credit card number, or send them a check. They can't bill you, they can't bill your provider, they can't bill your phone number, there is no way to bill you. So there is no way you can accidentally end up having to pay for something on the Internet.

You will know it very clearly, because it will say: Please enter your credit card number or please call us and give us your credit card number, or please mail us a check, or whatever it is. So there is nothing accidental, even with the pay services, there are free trials. You never have to worry about, for example, accidentally going over your free trial limit. They will cancel you. Like in your hotel, if you watch a free trial of a movie and you watch it for six minutes, they will bill you for it. There is none of that on the Internet. You will know if you have to pay for something.

M: [inaudible]

Andrew Kantor: The question is private investigators, he hears, are using the Internet and the Web to search for people who owe other people money, or just to find people. Yeah, it's being used. We had an article a couple of issues ago from a private investigator talking about how he uses the Internet to track people down because there are so many databases out there that are accessible, and you can even look to see if someone is posting a message.

The ways to search UseNet news for people, people who are posting... oh, well, there is the person, now he is in Albuquerque. That kind of thing. So private investigators are definitely using the Internet. If you have contacts and you really know what you're doing — and I don't, I'm not a private investigator — you can do what these people are doing about the e-mail [inaudible]. Get their social security number, where they work, all that kind of stuff. I mean, what came out from this guy... (Do you have it on here, that message I sent you, by any chance?)

Eric Berlin: I don't know if I have it or not.

Andrew Kantor: Because it's really worth seeing.

Eric Berlin: I don't think that I do. They found that social security number and all this stuff... Let's not forget that the Internet does not have every piece of information out there. Somebody came up to me at one seminar and said, "How can I use the Internet to find Virginia's state flower?" And I said, "Don't bother. Just post it in an almanac." It's much, much easier. The Internet is simply not for things like that. You can do it, I'm sure it's out there, but it's just ever so much easier just to look in an almanac.

Andrew Kantor: If you are interested, when this is done, I can show you just the information they pulled up on one person. The Internet is not going to give you abilities that you don't normally have. I mean, if you're a moron and don't know how to search for things in the library, you're probably not going to be able to find anything on the Internet that much more easily.

But the Internet gives you a lot more tools and it gives you a lot more information to search through. Before we go, we want to talk about ways you can learn more. Where you should go for more information after this. Besides the obvious solution, which is out there. Okay. Books to read that we recommend.

Eric Berlin: Is this in the *Elements* already?

Andrew Kantor: Some of this is in the *Elements*.

Eric Berlin: One that's probably not there is sort of the expended version of *Elements*. The diluted version.

Andrew Kantor: We can talk someday about dealing with publishers and how I'll never write a book again. *Internet World's 60-Minute Guide to the Internet* — it's my book, it's being sold out there. If you find *Elements* really helpful, you may want to buy the 60-minute guide. I wish I could plug it more and say, buy it, buy it, buy it, knowing that I get a couple of bucks out of it.

But honestly, *Elements* covers most, if not all, of the important stuff in the 60-minute guide. The 60-minute guide covers a lot of UNIX, for people using that, and goes into a little more detail on some things, so you may want to take a flip through it. I'm proud of it — I mean, it's my first book. But *Elements*, the free handout, gives you most of the basic information that you need.

Another good book is the *Complete Idiots*; there is *The Dummy's guide*, and *The Idiot's Guide*. I like *The Idiot's Guide*, but *The Dummy's Guide* is also very good. *Guide to the Internet*, by Peter Kent. It's a very good beginner's book.

Eric Berlin: These are more reference books: *The Internet Complete Reference* is just that — that is, one big book.

Andrew Kantor: Anything you want to know *The Internet Complete Reference* has, and actually the second edition is coming out soon. I would wait for that. It's by [Harley Hahn] and [Rick Stout] — [Harley Hahn] is around here, very nice guy — published by Osborne in Agoura Hills. And Kevin Savetz, also a nice person. Every Internet author is a nice person, with only a few exceptions. *Your Internet Consultant*, by Kevin Savetz — it's a question and answer format book. How do I sent fax through the Internet?

Eric Berlin: It's a very well-organized book, basically organized by question. You literally look up your question in the book, and there it is in the header, and the answer is underneath it. It's very well-put-together.

Andrew Kantor: Hopefully, the only shameless plug we have here, of course, is for *Internet World* magazine. We are the first, we are by far the largest, and, of course, the best magazine about the Internet. It's designed — the magazine, for those of you who haven't read it, pick up a copy on the floor because it's free — it's designed for people who are using the Internet. It's not written for newbies, it's not written for technical experts. It's written for people in between. I'm using the Internet, how do I use the Internet for business; what's going on; what are people doing on the Internet.

So if you're completely new, you might be stumped by some of it, but there is the entry level column, which will help you. Hopefully, this course has brought you up to the level where you understand most of the magazine, and if you're a real, real technical person, you may want one of the more techie magazines, like *Web Developer*, which tells you how to create things for the WorldWide Web. It's 20 bucks a year, you can't go wrong. End of shameless plug.

So when you come down to it, the Internet is all about communication and it's about information. It combines billboard, television, telephones, paper mail, libraries, reference books — all in one thing. Which is really great because you're putting all this stuff together in one thing: here it is on your desktop. On the bad side, there is a lot there and sometimes it's tough to use and to get used to. There's so much going on that it can be a little overwhelming; it's like walking into a library for the first time.

It really is just a big bunch of computers and just a lot of stuff on those computers. It's worth every minute you spend getting used to it, playing around with it, getting connected, being frustrated, staying up until two in the morning, trying to figure out how to access a Web

site, or how come this software isn't working, calling tech support. It really is worth it, once you get on the Internet and you start using it.

The example I give is my girlfriend, who is a nurse. She makes fun of me all the time; she always pretends to have an interest in the Internet, like I pretend to have an interest in, [for example], people giving birth. It's just, you know, we do this for each other. Well, then she got Netscape in her hospital — in the staff room there is a computer and it has Netscape — and I get a call from her and she says, "How do I send e-mail?"

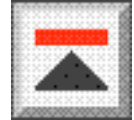
I'm like, "Why are you asking me this?" "Well, we have Netscape." "Really?" "Oh yeah, and I found this, and I found this, and I found this." All of a sudden she was all excited about it because the Internet was no longer this computer thing, it wasn't about computers anymore, it was about nursing because she found nursing resources.

That's the step you need to make so you understand how good the Internet is and why it is so important. It is not about computers, it is about information on any subject you can imagine, whether it's rollerblades, or cancer, or nursing, or gambling, there is information out there on the Internet. Because some of the people who are out there are interested in it also, and they'll make it available. Get past that hurdle — practice, practice, practice, and then you're on your way to Carnegie Hall. Stick with the Internet, it's a really great resource. I think that's about it.

Eric Berlin: I think it is, so I would guess that [it's time to sign off].

Andrew Kantor: Thank you all for coming. if you have any questions, or want business cards, or want talk to us, we will be here for at least another 15 to 20 minutes. Anyway, thanks for coming.

TUTORIAL THE COMPLEXITY OF SEARCH ON THE INTERNET: FINDING RELEVANT INFORMATION



SPEAKER

Christine Maxwell

Publisher and Senior Vice President, The McKinley Group

Christine Maxwell: [Welcome to this tutorial on The Complexity of] Searching the Net. What I hope that you will get out of this morning's presentation is some very useful information about how to have a more successful search experience.

Before I launch into that, I think it would be helpful for you to understand a little bit about my background and the background of the McKinley Group, for whom I am the publisher. I actually have been in the information business for over 15 years. I ran an information broker business called Research On Demand since 1982, and that experience has been extremely important in having an effect on how the McKinley Group has formulated and presented its own on-line directory. The reason that has been so seminal is because the work of Information On Demand was purely focused on helping people find information. Information about anything. It was almost like having a prescription pad for people's information ills, with everything from finding out where Einstein's brain is to the used-tire market in Korea. It's unbelievable; and to find that information was always, needless to say, an amazing challenge. As for Einstein's brain — well, we found a bit of it in U.C. Berkeley and the rest of it in western Missouri.

That was a very bizarre piece of research, but what that work really showed me was how difficult it is for people — anybody, from anywhere in the world — to actually understand how to even ask questions about what they are looking for. Most people don't exactly know what they're looking for; it sort of comes to them as they search. But when you are asking somebody else to do it you have less control, and so that is very difficult. That's one of the beauties of the Internet; it has actually put the power of searching in your hands, and that's absolutely marvelous.

But, having done that, it has also done something else. It has led us all into an Aladdin's cave where everything glistens and everything is gold for somebody. But where is your piece? There is no signpost out there that says, "Hey, this is it. This is what you're looking for!" You have to keep turning things over. And that is becoming more and more of a challenge and more and more of a problem because as the Internet grows exponentially every moment that we are sitting here, the chances of you easily finding what you are looking for are more complex.

So, of course, that is where the role of directories has come in, and that is what makes directories on the Internet so important today. When you take the term "Directories," one of the things, of course, that is very confusing about the Internet is that there are so many search tools to help you. There are literally hundreds of what are called "search engines," and then some of them are called "Web crawlers" and some of them are called "directories" and some of them are called "indexes," and it is incredibly confusing. So how do you make decisions about what to use to help you find what you are looking for?

I think it is also important at this point to say something about how the Internet has grown, and about the positions of Internet providers versus private, commercial on-line providers. By [private commercial providers] I am referring to providers like America Online and CompuServe and Prodigy, and I have always likened them to planets. Instead of calling them Neptune and Mars I call it AOL and CompuServe, because until recently they have been really planets of information unto themselves. If you wanted to get the information on that planet you

had to subscribe, as you still do today, and only sort of very reluctantly will they begin to make it possible for you to send electronic mail out to the rest of the Internet.

As the Internet has really now taken up our imagination — and particularly the part of the Internet known as the WorldWide Web — those private commercial providers have had to make their planets porous so that you can come out and visit the information on the Internet, because if they hadn't done that they wouldn't have been able to keep their client base. But their primary function in life did not start with the information on the Internet; therefore the tools by which they allow their users to come out from their planets and visit the rest of the Internet are not as easy to manipulate as those that allow you to go straight to the Internet from Internet providers who just provide the pipeline.

Today, of course, the browsers which allow you to get at the text and graphics are king: *Netscape*, *Mosaic*, etc. And then you have the kind of in-betweens; you've got *NETCOM* which has *NetCruiser*, which is a sort of full service that can give you access to the Internet but also provides a method by which you can search text and graphics. So it's a positively bewildering world out there, with lots of choices.

The other thing is that no directory will ever have absolutely everything at the time that it comes on the Internet because the Internet is growing so fast. I think towards the end of my talk I will give you some ideas of where I think all this is going, how directories are going to be changing in line with what is happening on the Internet.

One of the issues that is also important is to focus on why people are going to the Internet. It isn't yet shopping, primarily, and it isn't yet primarily looking at advertising. It still is — and I believe that it will continue to be — looking for information. That is the primary reason why we come, and in doing that there are many issues that directories today can take up to help us. They involve the issue of what directories present you with.

The directory, in the broadest sense of the word, literally means directing you to some information; but if you go into the Internet right now — and we'll talk about using it from the browser from *Netscape*, because it is the most prevalent — you are given many, many different search engines to choose from.

Now, about search engines... What is behind these directories today? I'm going to go into quite some detail about what differentiates them because it has a major impact on what information comes back to you. Search engines are this enabling technology, and companies have — they used to be just those who did it on a volunteer basis. It started off as a volunteer thing; then, of course, as the Internet has grown you've had commercial entities who have come in to really take on that role, because without some funding coming in it is very difficult to keep these things going and useful. The search engines go out to the Internet and are capable of literally slurping up Internet addresses. The issue of what makes them different, one from another, has everything to do with what intelligence they have been given in order to do what they do. At the very least they might go out to the Internet and just pull in Internet addresses, and then what you get presented with is this laundry list of hotlinks to click on. That's at the basic level where there is nothing else except the links.

Then you've got some that are able to actually catalog more than just the title and the URL, [which is] the Internet address. Some of them catalog so many words — 28 words, 36 words — and some of them are far more sophisticated and actually take all the information from an entire page, like the Home Page. And some of them are even more sophisticated than that and go beyond there, going down into the links and pulling information out.

First of all, there is an issue of the differences about how they do that; and then there is everything to do with how the taxonomies are prepared for each of those different catalogs. Taxonomy — that's not a word I was very used to saying to anybody a few years ago, even though I've been in the document delivery and the research business — but today, within the

context of the Internet, it is the difference about how those are put together, and it's going to continue to have a major, major differentiating affect between one directory and another. That's another area that I'm going to be able to show you.

Finally — and this is my last point before we actually have a little trip on-line — today you can browse, and you can ask questions of the Internet in two major ways.

The first way is that you can literally do a word search. A word search can go into two ways: it can be a “keyword” search, where you just put in one word or two words; or it can be a “phrase” search where you literally put in a sentence, like “Weather in Boston,” or something. And then it can also be a subject search. That's the “browse” search, where you go into much larger categories and click on the category of Sports or something and then make selections. Those are the two major ways you are seeing over and over again in different catalogs, and we are going to examine how they differ from each other.

Netscape presents you, right off the bat — if you hit on the “Net Search” button up at the top — with some choices. You get *Lycos*, *WebCrawler*, *DejaNews* and *Excite*. I'm going to just take you through a little bit of information about each of these and then I'm going to do some comparisons for you so that you can begin to understand, I think, more about what the differences are. When you understand what the differences are you will make better decisions about where you first go to search — and time is very important, I'm sure, to every one of you. If all of us had 99 lives we'd just sit there and search 'til the cows come home and have a wonderful time, but most of us don't have that luxury. So this is what today's presentation really is about; it's about how to help you home in and choose your search methods in a much more effective way.

Lycos certainly has the most URLs. It's absolutely giant, with millions and millions. But the problem today is that volume isn't where it's at; volume without quality is a problem today, and the *Lycos* search thing — when it searches it pulls up only a small amount of information from each URL, and it doesn't take the whole page. So it's doing its ranking, its relevancy, on a much lower proportion of information than some of the other search engines. Yes?

M: I noticed now they reformatted it to get sort of an abstract. Is that like the first 1K out of the page or something?

Christine Maxwell: Yes. It's very small. McKinley's *Magellan* does 32K of information. It's much, much larger.

M: I was just wondering if there is a reason you're skipping it [inaudible]

Christine Maxwell: No, absolutely not. I skipped it because it wasn't up at the top there. *InfoSeek* is a search engine, and it has a very strong engine behind it. It captures about three or four lines; every time you do a search with it you are going to get three to four lines of information. But it is an excellent example and we will be using it.

I've talked about *Lycos*. *WebCrawler* basically gives you the URL line and the title. It is truly a laundry list; I have always thought of it as that, and I still use it. Each one of these search engines often will give you something that the other doesn't, so they're up there for a reason and I think that it's useful to compare them. Yes?

M: [Inaudible]

Christine Maxwell: No. *DejaNews* is different in that it is pulling together all the relevant hits from newsgroups, and so it has a very useful place. *InfoSeek* does that also, but the difference

there is that *InfoSeek* gives you a limited access and then you have to pay after that to get more, whereas *DejaNews*, at least at this time, is a free service. We will go into that also.

Excite is a recent addition to the search engines and directories. It has behind it an engine called *Architext*, and it is a very strong engine. When we go more into actually what is the value-added information that they provide, you will see some rather interesting differences.

Now let's just go to *Magellan*, which is from the McKinley Group. *Magellan* has been up fairly recently, and it's the newly named database of the McKinley Group. The engine that it's running on is PLS, and it's a very strong one and a very good search engine. One of the differences that *Magellan* has is the method by which they have put machine intelligence and human intelligence together so that what the Web crawler is actually calling — it's a very choosy Web crawler, because it doesn't just slurp up everything. The other major difference is the amount of information that it actually calls while it's searching; it's 32K, which is a tremendous amount of information that it's pulling up. What that allows is that when the machine actually makes a description, it is actually able to pull a lot more information and then rank it much more appropriately so that your ability to get a more targeted search is probably going to be much higher.

W: [Inaudible]

Christine Maxwell: The only thing I can tell you is that it's extremely fast. It is actually as fast as any of the other crawlers. That's to do with the technology behind it, which is proprietary — and even if it wasn't I'm afraid my technical aspect on how these things work is that I still think they're magic. But we can go into that in a minute.

M: [Inaudible]

Christine Maxwell: *Magellan* does. It's one of the unique features of *Magellan*, that in the actual resources there is a field for language that gives you the information about whether the resource is available in other languages. And if it is, then you would be able to access it. That is one of the differences in focus of *Magellan*, that it has an international focus.

One of the things that I did want to mention, because I think that it's important, is that if you do some research into who are the organizations behind these Web crawlers and directories, who are the people who have brought them into being, there are some very interesting differences. The McKinley Group has over 50 years of international publishing in its background, in international publishing and information brokering. That adds, as I said earlier, some very, very important issues in terms of how we go about bringing information together and how the information is actually presented. When you have a publishing background, I think it does an enormous amount in really helping to bring an understanding to how people look for information and as to how it should be presented.

I thought I would take some examples now and start really doing some searching, because then you can see some real differences for yourselves and come to some real opinions. I thought we would start with "Weather in Boston." Why not? As you can see, *Magellan* allows you to literally stick in some words, so I did — "Weather in Boston." And then we are going to search *Magellan* and just click on it. It tells you that there were more than 60 records found; and what *Magellan* does, what you are getting right off the bat there, is the title of a resource. These are star ratings — which I am going to say more about later — and you can go and look at a summary of information. One of the things that is going to be very important over time is the value-added information that you get right off the bat. What is it about each of these

directories that gives you information that allows you to make a much more informed decision about whether you take the time to visit a site or not?

So, in *Magellan*, right off the bat, you get some star ratings. Now, ratings are a feature that — let's go into the summary there. This is a summary that is put together by *Magellan* and the McKinley writers to help you make a decision about whether you want to visit the site or not. If you look at it, you get keywords, you get audience fields, a description, what language it is or whether there is another language, you get who produced it, how you can contact them, whether there's a cost and whether it's a commercial site or not. You can then get some additional information about the ratings, what that average rating there is broken down into. Now, the coverage also gives you information about how complete is the coverage of that resource, bearing in mind what it says it does in life, how well organized it is, how up-to-date it is, and how easy it is to actually get at. You can, at this point within *Magellan*, go and look at some more science topics and get a whole new series.

M: I understand this summary information is taken from the [inaudible]

Christine Maxwell: Well, let me put it this way; in most cases the answer to that is yes. In *Magellan's* case, these are actually written by our "cyberwriters." That is the biggest difference, the level of human intervention that we put in. We actually go in and review and evaluate and scribe and rate each of these resources, so we actually write that information. That is not taken from the Web crawler itself. It is not a machine who did that, it's a human being.

M: [Inaudible]

Christine Maxwell: When you put in a query, "Weather in Boston," the machine went into the database and pulled out and then ranked any resources that concerned weather and Boston. Now, we have already been looking at weather resources and we happened to have put into this database resources that particularly deal with weather in Boston. That's why it's come up. We are going to do a similar search now in *InfoSeek*.

M: [Inaudible]

Christine Maxwell: Over a million sites today.

M: You have reviewed a million sites?

Christine Maxwell: No. We've reviewed and rated over 40,000 and then we have, in *Magellan*, up to a million unrated resources that have been pulled in. The reviews that are there [in the unrated resources] are not yet reviewed by our humans, they're reviewed by *Magellan* itself.

M: Who do you choose to [inaudible] in your database? Is it automatic? Do you have a crawler going out and actually searching? Do people register with you?

Christine Maxwell: Yes. The answer to both those questions is yes. We do have a crawler. As I explained, it's an issue of the combination of human and machine intelligence that we have personally, specifically devised that goes out onto the Internet and crawls the Net. But once that information is crawled, then we have a whole slew of cyberwriters who are experts in their own field who go in and then review and evaluate those resources.

M: How do you choose who will evaluate them?

Christine Maxwell: I will answer that question but I would like to go a little bit further along because otherwise I think we'll lose the thread of some others. I'll come back and answer that. Is that all right with you?

M: Sure.

Christine Maxwell: Okay. With *InfoSeek* we also searched for "Weather in Boston," so you now get Boston Weather, Weather Conditions, the MIT Meteorology Department, etc.

M: Is that an Apple feature or is that [inaudible]?

Christine Maxwell: We're on a Macintosh.

M: I know. Is it a Macintosh feature or is that a Net feature?

Christine Maxwell: That's a *Netscape* feature that allows you to — well, it's Mac, too — that allows you to have the two windows up. The point I'm making here is that *InfoSeek* gives you this amount of information and now you can go straight to the site. But in *Magellan* you have this information, you have ratings, and if you go to the summary you're going to get that detailed summary. That is a unique feature of *Magellan*. Let's go back into *InfoSeek* and go back to [Netscape's] Net Search so that we can do some other. Let's try *Lycos* now.

I want to go through this exercise because it really does help us to have some remembrance of what happens with individual directories. After we've done that we're going to go into the areas of broad category searching, but we'll stick just for the moment with some little phrases.

Lycos, as you can see, presents you [with] intelligence. Now, in the way they do an abstract, this is also machine-generated. No human beings put this together; I think if they had they would probably go nuts. The highlighted words are there, but it's really quite difficult to get into that. I mean, when you've got a lot of these things to look at it's really hard work to focus on what they're giving you there. *Lycos* have actually just bought Point Communications, which is another directory, and we will go into them a little bit more. Point Communications says that it focuses on the top 5%, but it doesn't really explain how it goes about doing that; but we can look at that a bit more later.

Okay, let's try *WebCrawler*. Now here's the laundry list that I was referring to; you know, many of the directories really don't give you too much more than that, and that's a real guessing game at this point. You might be lucky. Remember we said that we were looking for Boston? Well, [we've got] a weather page, London page I, Boston on-line — there it is down there, but you don't get any information. You've got to go into the site and decide whether that's going to help you or not.

M: Do you get a lot of replicates on this? You see the second and fourth are replicates.

Christine Maxwell: Right. Well, replicates actually are a bit of a difficult thing; you can get rid of them but it takes some extra steps within the machine to make that happen, and it's quite complex. In *Magellan* we have some of that problem at the moment. We know how to get rid of it and we're working on it, but that does happen.

M: [Inaudible]

Christine Maxwell: No, it doesn't, but that just shows you the differences of how the Web crawlers work.

Let's go into *DejaNews*. As I said, *DejaNews* is different in that it is dealing with newsgroups, but it's really interesting. I could have done this in *InfoSeek* also. *InfoSeek* does that very well. We are going to get a very long laundry list of things to look at and here you just have to choose "Rain," or anything like "Weather in Boston." You would click on that. I'm not going to go take it further, but this is what you get when you use *DejaNews* and it's a complementary — I mean, you never know, of course, whether there's going to be something useful here or not, you've just got to look. So that's a lot of looking.

M: Are you basically going to find a site on the Internet or just a note posted on the NewsNet groups?

Christine Maxwell: You would find a note posted on the NewsNet groups.

M: Something about weather in Boston like five years ago?

Christine Maxwell: Well, who knows? I don't know. We can go [with that crawler and find out]. Why don't we just click on that one that said "Weather in Boston?" I don't know, we'll see. Well, okay, there's the peril in searching.

W: This one, the object that was selected was the [inaudible] search, and I'm just wondering if the other type of search is a little better.

Christine Maxwell: It might be. I think I want to take that on when we go into the more complex search, so we'll come to it in a minute.

Okay, let's do *Excite*. Let's see if we can get excited about the weather here. [The categories that come up are] Boston, Cambridge, Summary, City of Cambridge Home Page and Boston Weather. So there certainly is — again, this is like *InfoSeek* in the sense that, again, that's what you get. You don't get any further information from them. You have to go to the site, so that doesn't tell you too much.

One of the other things that comes up which is very important, I think, is what on earth do all the directories mean when they throw out words like "reviews?" What is a review? That's an interesting question. I would not say that was a review. Some people do; they call reviews everything that they write and I find there are many, many issues there about what is a review that's really helpful to people. Any amount of information is going to help you, but the more you can get the better. Can we go back to *Magellan*?

M: That was reviewed by humans?

Christine Maxwell: No, this was reviewed by machine. A machine did that.

W: It percentages the relevancy.

Christine Maxwell: Yes.

W: Can we still see [inaudible]?

Christine Maxwell: Yes, sorry. One of the things I'd like to do is go into [the category] "Boston On-line Summary." I just want to refer a little bit more to this issue of review because I'd like you to understand a little bit more about the history of how *Magellan* reviews are actually put together.

We have been putting this database together for over two and a half years. We have had a lot of background and experience in working to make this look the way it does, and the biggest lesson that I've learned from all this is that you cannot arrive at simplicity without going through complexity first. It has been extremely difficult and we are in a constant state of change about how we put together descriptions. When we first started we actually started doing, literally, descriptions only, with information informing the user about what they could expect to find in a resource. And then, later on, we decided to put in more review information, more editorial information about the content. And so what you are going to be seeing in *Magellan* is that progression from description more to actual review. We have come to that because, again, with so much information out there it really is important that the expertise and the hours and hours of looking at thousands and thousands of resources has given us a perspective about what's available on the Internet that we think is going to be helpful to users. That is what we are doing. So when we talk about reviews, we are genuinely making a tremendous effort to provide you with that kind of information.

What I'd like to look at now is some information about "browsing," or subject searching. When is it a good idea to go that route rather than just a regular, individual word search? I want to take you through browsing categories a little bit and then I want to go back to the subjects, the individual word search, and talk a lot about how to use the power behind the search engines because these search engines, including what's behind *Magellan*, are immensely powerful. They are able to help you focus right down to some very specific searching. You don't need to know, and I never wanted to know, how that happens; but I just wanted to be able to do it. So let's just talk about browsing categories for a minute.

If you'll click into the "Browse" category of *Magellan* you're going to get about 15 major categories of information there — you know, Arts and Music, Business and Economics, Law and Criminal Justice, etc. If you leave that one up — let's go back into *Netscape* and back into "Net Directory," where we're going to have a look at the *Yahoo* browsing categories — and here are major categories from *Yahoo*. Do a new window and bring it into the *InfoSeek* categories. Categories are helpful to a point; it is very difficult because, as you can see, everybody's got a different idea of what words to use. But if you start with a category — let's go back to *Yahoo* if we could — and you wanted to find "Music," for example, if you look at the main categories, you've actually got a hard time right there. I don't know where Music is. Go back one, go back on this page. Okay, here's what you get first, right? So there you do not know where Music is. You have to guess.

M: Are the categories mutually exclusive?

Christine Maxwell: Well, that's an interesting question. In some of the directories they are, and that's a problem because instead of doing a full text search across the entire database, some of them are in a box; and if you go into the wrong box you can't find it, and there's no cross-searching. So that's another issue which helps you make some decisions about which directory might be better for you in terms of how you search. I guess what I'm saying is that right there you don't know where Music is. You would have to guess.

M: It could be "Art."

Christine Maxwell: It could be Art. Let's check Art, let's go into Art. You're right, we made a good selection. But what I'm saying is that in any one of these, in the broad categories, you've got some issues about not knowing where to start.

W: What does the "@" sign mean?

Christine Maxwell: The "@" sign is part of the... Where do you see that?

W: Right by "Music and Philosophy."

Christine Maxwell: It's a cross-listing; it means it's a cross-reference to stuff. We can click on it and we'll have a look. It takes you to "Entertainment," and then it takes you into this whole other area of stuff. What's interesting about that, actually — here you've got subcategories under "Arts and Music," and let's go into "Architecture" for a minute. I'm just going to take you through it. Now, the thing about *Magellan* is that when you go into any of these subcategories and you put in your search there, you can focus your search. You can look at these entries and you could go in there and you could say, "Architecture," and then you could actually say, "Paris," for example, and it would refocus it down for you right then and there.

M: Do those billboards change all the time?

Christine Maxwell: Yes, they do. I will say a little bit more about advertising. Of course, you are noticing that there are advertising banners appearing, and what we found was that although *Magellan* has sold its database act to Internet providers, the real key is that we want it to remain free and we want people anywhere, all the time, to be able to access that directory. In order for that to happen we have also had to introduce an advertising model because we can't do it on the Good Samaritan basis; it wouldn't last very long. The interesting thing about that is to look at how directories begin to use advertising and how they organize that in a way that still makes you want to search the directory, and doesn't make you mad about what you see. That's going to be interesting; those will be one of the criteria, perhaps, for why you go to one directory and not to another.

Here's some Architecture sites. Let's go back into *Yahoo* for a minute. Let's go into Architecture... Did we find it? No. Go back up to "Art" for a minute. There's something that is very important to understand about how *Yahoo* works, how its taxonomies — there it is. Click on Architecture for a minute. That's very interesting, because what is happening is that we've gone down three huge levels in *Yahoo*. We started at Art, then we went into Architecture, then we went into this, right? In other words, it's a hierarchical structure; it's taken you down and down and down and eventually you'll go down into Australia and come out the other end. The problem with that is that it actually can't go on doing that. It's going to break because the more information comes in, they keep adding more and more links down and after you've been doing that for about 30 minutes, the fact of the matter is, if you ask 90% of people after 30 minutes, "Do you know where you are? Do you know how to go back?" you don't because you've lost your trail. Unless you're with the Minotaur and you've got a thread with you, you won't find your way back. That is a great difference between *Magellan*, in this context, and *Yahoo*. *Magellan*'s data and taxonomy can expand with the size of the Internet. It grows out, it doesn't go down.

W: Would you make more categories at the top level rather than making more levels?

Christine Maxwell: It's cross-referencing the categories across, it's a full-text search engine. It goes right away across the database all the time. It goes for depth and breadth consistently, it doesn't just keep going down into sections. Things are not just attached to one tree.

M: *Yahoo* categories [inaudible], that's created by humans.

Christine Maxwell: Yes. They decide where things go and they keep making these categories.

M: So they've made it network by adding a cross-link as opposed to a strictly "tree" structure.

Christine Maxwell: Yes. Let's go into "Architects" for a minute and let's have a look at something. Okay. Now you're finally getting to an actual, individual resource and you're getting some information about them. But there is a tremendous difference in the human intervention that goes on here compared to what is happening in *Magellan*, for example. Let's go into *Lycos* again.

M: [Inaudible]

Christine Maxwell: Gosh, it varies enormously. *Magellan* is now getting about a million a week, and the others are, well, *Yahoo* is getting quite a bit more than that. It's several million, but it's been up a lot longer. *Lycos* is getting several million also. You know, the point is that there is some difficulty at the moment in understanding what those hits are made up of because those several million... For example, the most searched Web site on the Net today is actually *Pathfinder*, Time-Warner's site, and we'll look at that later. Now, that gets 15 million hits a week, but they've revised that down to six million because what happens is, once somebody goes in there, they click on different pages. You know, there's an issue of how you count the clicks. So it's an interesting question. There's a lot of controversy going on right now about how you count when people go where.

W: [Inaudible]

[Tape change]

Christine Maxwell: Yes. The other thing, though, that's very important is that knowing where people go within a resource, which actual page do they pull up, that's very important from an advertising point of view, of course.

M: [Inaudible]

Christine Maxwell: It's very important for us because we want to know where people are looking and we want to make sure that we give you more and more resources where you're going. I mean, there is no question that "Entertainment" and "Weather" and "Sports" are, quite apart from the "Chat" aspect, absolutely the sites the Web people are going [to] today more than anywhere else, and we have to pay attention to that.

M: A big factor in tracking your site are that proxy servers mask activity against your site by delivering pages out of the proxy's cache, so that your site never gets hit again.

Christine Maxwell: Yes, that's another issue. Once you've got it on your memory, so to speak, then you've got it there. So there are lots of issues; but, nevertheless, it's actually very exciting in terms of the information. You, as an information provider who has your site up on the Net, you are getting important information about what's happening, who's visiting your resource. This is a little bit off the track, and I'll come back to that. I think it's very important and I don't want to lose it, but I'd like to just keep going.

W: I'd like to go back to a statement you made contrasting the hierarchical approach to the breadth approach. I'm wondering if you could go into a little more detail on why the breadth approach doesn't cause you to lose your way, and tell me a little bit more about it.

Christine Maxwell: Okay. When I say it isn't breadth or depth, it's depth combined with breadth, that's what *Magellan* does. *Magellan* doesn't just do a hierarchical tree that goes down and down and down. The reason why we don't do that is because more and more information is coming on, and you can't keep going down because then you can't come back up easily.

W: I understand that. I understand. The hierarchical is very easy to understand, but I don't understand what you mean by breadth.

Christine Maxwell: What breadth means, in this context, is that if you have a search engine that has the capability to go through its entire database when you put a search in — let's go back to *Magellan* and just do something else. Plunk in "Travel for Business." Let me explain to you what's happening here because I think that might help.

W: I just think you're comparing apples and oranges, though, when you don't show *Yahoo* searching.

Christine Maxwell: I'm going to show it right now. What's happening to bring up this data is that it's gone throughout the entire database looking for the words that you have put in. It doesn't just go down into the "Travel" section or the "Business" section, it's gone everywhere.

W: [Inaudible] phrase is made up of the keywords that the various resource providers gave you.

Christine Maxwell: No, we have brought those words in. But it's not just keywords, it's the full text of the actual resource itself. We go into the pages, we don't just search the wording that we gave it or the descriptions that we wrote.

M: [Inaudible]

Christine Maxwell: That's right, exactly. Let's go to *Yahoo* right now. It offers a directory of illustrated listings for Real Estate, Travel, Marine Vehicles, Business Opportunities, Extensive City and Town... Okay, leave that up and let's go into [Netscape's] Net Search, look at *Excite* and see what it gives us, and then we'll do it in *InfoSeek*. Agents, Travel, Travel On-line, *Yahoo* Business and Economy Companies, Travel, On-line Source for Amusement, Entertainment, Business Travel... Let's see. Travel Arrangements Made and Not Delivered. Well, there is certainly some stuff here.

That's a good hit, I would say. Business Travel for University of Illinois Employees, very good. Business Traveler On-line, that's a very good hit right there, I think. That's the first set that I've seen that actually had brought to my mind some of what I thought I might be looking

for. Go into *Magellan* for a minute. I don't know if we've finished the search there. Association of Business Travelers... keep going... bus.travel.com — hold it — On-line Magazine About Business Travel. Click on the summary for a minute. On-line Magazine, Latest News. There you can see a lot of difference about — you can actually phone them, you can contact them by e-mail if you needed to.

This is *Magellan*; let's go back to *InfoSeek*. Are we in *InfoSeek* there? I think we are, aren't we? Yes. There, this is what they give you. This is *InfoSeek*. Once you've done a search you get the title and you get three lines and the URL. That's what you get from *InfoSeek*. You don't get any ratings and you don't get further information than that without actually viewing the site. If you go to *WebCrawler* — that's if you wanted a real quick-and-dirty with just lines — you can certainly get it. Business Opportunity, Financial Opportunity, FAO Travel, Business Travel Management. It's a real hodgepodge.

M: You're comparing yourself to *InfoSeek*. One of the things you're comparing is the search capabilities on the *InfoSeek* and yourself, and one of the advantages you're talking about [with] *Magellan* is the summary aspect of it. Why do you feel that it is better to have the summary when you have to get to it by a click, whereas in *InfoSeek* you can get to the actual page by a click as well?

Christine Maxwell: You can get to the actual page by a click with *Magellan*, but the summary information gives you — you can make a choice about getting more information or not, so it's just as simple. It's just that if you don't want to go into a resource [you don't have to], if you want to know more, you have a choice to know more. Here is where in any directory you are going to see, over time as they differentiate themselves, that is the issue of value-added information, and that is something that the users are going to have to tell us more about — what's useful. That's why we didn't put it all on the first page, because it's a choice issue. You may not want to, you've seen enough, you've got enough information and want to go straight to the site. You don't want to read all that; but if you do want more, you've got it.

W: [Inaudible]

Christine Maxwell: How do you get there? Just www.mckinley.com.

M: When you're doing a search, do you do the search one of two ways? Do you do keyword [inaudible] is there a crossover or is there to a certain extent [inaudible]?

Christine Maxwell: The amount of information you get back in terms of how many hits will differ, but with the actual amount of content that you get back, one or two of the directories gives you a choice there.

M: [inaudible] a concept or a keyword? *Excite* does that.

Christine Maxwell: *Excite* does that. *Magellan* does that. Let's go to *InfoSeek* for a minute and let's look at the issue of the more complex search. Let's look at the issue of how to search better. They are talking to you there about being able to come up with different words or phrases to help you do a better search, and the point is that most directories have a default. When you first put in your terms that you want to search for, for example, if you put in "Vincent Van Gogh," some directories are going to default to "or" so they'll look for Vincent or Van or Gogh. Or some of them can be made to default to Vincent or Van and Gogh, and you're

going to get different results depending on where those default things are. That can get very confusing at first, [with] capitalized words only when appropriate. When you look through all this it makes it very hard to take all that in, because what they are talking about here is that they work with something called “Boolean logic,” and that allows you to.... Yeah?

M: That concept search that architects support [inaudible] PLS, they can use a thesaurus [inaudible] the keywords into other terms. If you say Van Gogh you might also find a thesaurus [inaudible] to match other things.

Christine Maxwell: Right. That’s like “Fashion” and “Apparel,” for example, where the thesaurus puts some additional words into its searching so that you get a richer feedback than you would by just using the words that you put in. That’s what you’re talking about. Why doesn’t someone suggest a search this time? Who has got an idea for something to look for?

M: Pay for Skills.

Christine Maxwell: “Pay for Skills,” okay. I did not use the word “for.” The following is the “New England Role-Playing Organization’s School Internet List and Job Announcements,” a sampling of job opportunities. Okay, let’s do that same search in *Excite*, in *Net Search*.

M: The reason this doesn’t work very well is because “pay for” is the way the English verb is constructed, not just “pay skills.”

Christine Maxwell: Yes, but it is a good example. I mean, when people just want to say what they want to say, it is helpful to understand that maybe we should go back and try and use those words in a different way and see if we can get a better result. “Developing Employable Skills,” that looks pretty good. “High Skill, High Wage.” This is a much more relevant search there than the first one that we did. Try it on *Magellan*.

Now, what’s interesting also about *Magellan*... I just want to do this once. Go back up to the top and search. This is all the rated areas, but you can also go into the unrated *Magellan* where there are even more. Just click on “Search” and it will do the same thing again in the unrated part of the database. This is just interesting, actually. So you can see the difference between them. Okay, so these are not rated and these descriptions here are the ones that have come up by use of the machine itself, using our taxonomy and the intelligence that we have given it. So these will all get reviewed and evaluated. It goes through our system, but it hasn’t been done yet.

M: When you first do a search, you are searching [inaudible] only to 40,000 [inaudible]

Christine Maxwell: What happens is that’s what comes up first because obviously those are going to be much more likely to be the ones you’d want to look at.

M: And then you can search further for the uncharted waters.

Christine Maxwell: That’s right. Well, they’re unreviewed, they’re not uncharted. They are still selected. Let’s go back. You wanted to search — was it “Women?” I heard “Women” and I didn’t hear the rest.

W: Women in Government.

Christine Maxwell: Let's just try "Women in Government" and then we're going to go to another different thing. [Here's what comes up]: University of Maryland at College Park System, Women's Studies Database, Virtual Sisterhood, Women's Studies Programs. I don't see Government too much here at the moment. Try *Yahoo*.

M: I'm interested in a different type of search.

Christine Maxwell: Yes, I'm happy to do it.

M: [Inaudible]

Christine Maxwell: You can do a back search to get that.

W: You can find out who is pointing to you?

Christine Maxwell: Yes. If you send me e-mail, do you know how to do it? I know you can do it.

M: Well, I've done it by looking for my site using some search engines and finding —

Christine Maxwell: No, there's an easier way to do it. You can actually just put in some particular thing and it'll come up for you. I know you can do it, we've done it. If someone is interested in that, you'll have to send me e-mail at maxwell@mckinley.com. It's a very useful thing to know.

The *Yahoo* search is up. Business and Economy, Organizations, Public Interest Groups, Elections, Voter Information, League of Women Voters. Well, that's pretty good.

M: I see it's highlighting things like that contain the letters "in."

Christine Maxwell: Right. That shows you what it picked. Try that in *Magellan*... Office for Women in Politics, Women's Rights, Beijing Women Power and Change, League of Women Voters.

M: It's clear that's the best hit.

Christine Maxwell: That's the best hit there. Okay, let's have a look at the issue of reviews a bit, because there's a lot of change going on in that and I want to point those out to you so you can be aware of them. Let's go to *Lycos*.

Reviews are an area where I think you are going to find more and more change coming up. I think what's important is how the directories come up with reviews. What's behind those reviews? How do you know how they are arrived at them? If you take *Lycos* — and the reason that I wanted to look at *Lycos* is because, as I said, they've recently acquired Point Communications and Point Communications started out quite recently. Actually I think it's been up for about a year. And they talked about writing reviews of sites and I think that what you are going to find when you look at reviews and compare them... Uh-oh, we can't get in right now.

M: It should be www.lycos.com. The Carnegie-Mellon site is down.

Christine Maxwell: Right. There's a tremendously different style going on in many different places about how sites are reviewed. Many of them have a kind of glibness about them, you know, trying to entertain, perhaps, rather than inform — you know, the entertainment goes for the information. That's something that you yourselves are going to judge.

There's "Point Reviews" up there and let's go in there for a minute and see what we get. There it talks about the top 5% of reviews. Let's go in there and see what happens. It isn't very clear why it's the top 5% of those reviews; but if they've reviewed everything else and are therefore able to say that these are the top five, or they made some decisions about those... Let's go to "All Reviews." We still haven't seen any reviews. We're doing a lot of clicking here. They haven't yet amalgamated this into the Lycos data system itself. I don't know whether they will or when they will, but they haven't done that yet. So here you are, it's a nice interface. Would somebody make a choice for me? I don't mind. [How about] "Kids?"

Now, Point Communications, when it was first up, didn't have a searchable engine across it. In other words, if you went into that box and you didn't find something, it didn't search across the database for you, and you're stuck with whatever is in that box on that day. Okay, we're still choosing. Go into Parenting. Go into Baby Pages. A review, finally. Now, here they've got this percentage, this relevancy for reviewing. They give it 30 out of 50, 28 out of 50 for presentation, and 35 out of 50 for experience. I'm not quite sure what kind of experience is being rated there. Mine? Theirs? I haven't been able to find any information about how this is arrived at. What does it mean? "Passing out cigars at the office. New parents can now tell all the world about their pride and joy with the on-line birth announcement service." Well, that's actually quite fun.

M: Whose standards are being used in these various reviews? For example, in *Magellan*, whose standards are you using?

Christine Maxwell: I can tell you obviously a lot more about [how] we go about rating, and I will do that. As far as this is concerned, I can only see what I see. One of my questions is that I don't know how they arrive at those ratings. I can tell you how we arrive at our ratings.

M: What I'm saying is, is there no industry standards for reviewing information on the Internet?

Christine Maxwell: No, there are no industry standards. That's one of the complexities and challenges of the Internet, how standards get created. One of the things that *Magellan* is working on is developing a standard of ratings and how we go about doing that. How do we do the ratings that we do? I can only tell you the details about that because the issue of standards is very important, the issue of consistency. What is it that you are rating?

M: Do you work with someone like the American Library Association?

Christine Maxwell: What we do is we do the following: first of all, the taxonomy that we created was originally based on the Library of Congress classification system. Then we worked very closely with the American Society for Indexes to work on how to make that taxonomy something that wasn't just a figment of our imagination. It's very easy to be sort of opportunistic and say, "Oh, let's put this here, let's put that there." It was done in a very consistent way. When we went into rating — and let me pull up our rating system for a minute, because it's easier to show it to you...

M: Are you going to mention the Advisory Board?

Christine Maxwell: Yes, I'm going to mention the Advisory Board, thank you.

Just click on *Magellan* for a moment. The other issue is that the way that *Magellan* rating is done is that we have an international board of advisors, and that board is very, very important to us. It is headed by Dan Lynch, the chairman and founder of InterOp, and we have invited onto our board professionals and academics from all over the world who are at the top of their fields in many, many different categories. For example, Professor [Maury Galman], the Nobel physicist who found the quark. We have Professor Neville Postlewaite who was the head director on the International Encyclopedia for Education. And it is that expertise that, again, comes from our international publishing background.

I worked as a director of marketing and a director of Pergum and Press Publishers for over 20 years, and Pergum and Press itself had over 500 of the top review journals, and every one of those journals had editorial boards. Those editors are extremely important in terms of formulating a bridge between all the best of publishing in the conventional sense and what is happening on the Internet today.

So the establishment of standards is very, very important. If you look at how we go about doing a rating — [we'll go] into "Women, Power and Change, Beijing 1995." It has an average there of a four-star [rating], and we are actually moving forward in that rating system. I'm the publisher for the McKinley Group. I set the standards and I set the policy by which we started our ratings, and let me give you a little bit of a background on that because I think it answers your question, at least about us.

When we first started rating I was very concerned to ensure that what we rated was very factual information, because I didn't feel at the beginning of our process that we had enough experience ourselves in being able to say, "Oh, this is the greatest site since sliced bread." Who the hell were we to say that? I mean, a lot of people think they can say that, and indeed they do. But I didn't feel that we, the McKinley Group when we first started out, had that background; so I thought it was much more important to look at the facts so that the facts were not "editorial make-up."

So the first thing that we rated was coverage. What we're trying to do there with that rating is to say, look, this site says it is the "Beijing Conference on Women." That's its content. Does it deserve the top-star rating because it covers the breadth and depth of that content? In our opinion, having looked at that site, does it or does it not? But that's what this rating breakdown is about and that's how we arrive at it, okay? For example, there are many sites that are very poorly named. There are sites, for example, that call themselves "The Pacific Rim." Oh, terrific. And you go in and what's it all about? It's just Japan. Well, that's marvelous for Japan but it's hopeless for the Pacific Rim. It is not going to get a four-star rating from *Magellan* in that context.

The organization [of the site is an] issue. Again, that is fairly factual. How well organized is the resource? Can you find your way around it easily? Do you get a sense right from the Home Page what you're going to find? Can you click immediately on the menu system? Is it really easy to find your way around? Again, we think that is something important because it tells you something about how much time you are going to have to spend in that resource to get what you want out of it.

The up-to-date issue is an interesting issue. That up-to-datedness actually is covering two aspects of up-to-datedness. The obvious one is, how recently has the site been updated? Is it something where it was updated yesterday, last week, or is it a site where even though the content was actually written in 1947, it is still up-to-date in terms of what it tells you? So you're talking about the seminal information that you can get.

There's a marvelous resource that I always think of when I think about that. Let's do a search on "Thinking" in *Magellan*. I've looked for Thinking in other resources and I find it hard to find. Let's go up and do this because this is such a wonderful article. It was written by Danover Bush in 1947. It was in the *Atlantic*. Anyway, he wrote that article to try and encourage scientists after the bomb had gone off to think positively, to come up with new ideas; and this man foresaw Windows, he foresaw the Internet. I mean, it's an incredible read. That's what I mean by finding information that — even though it was written in 1947 — is just as valid today. So when we talk about Danover Bush, there he is, an unbelievable read. Anyway, find it in Thinking under *Magellan* [www.isg.sfu.ca], etc. That actually came out of the — what's the one where they have all the big books? I can't think of the site.

M: The Gutenberg Press?

Christine Maxwell: The Gutenberg, Gutenberg. This is buried in Gutenberg also, if you take the time to find it. But anyway, we'll come out of there. But I just wanted to make the point that it isn't just the fact that it was written yesterday.

W: [Inaudible]

Christine Maxwell: The answer to that is that we constantly re-review the resources every few months. Some sites need to be reviewed literally every couple of weeks because they change so frequently. How do we deal with that? That's an issue of technology, because technology can show you whether a site has been updated or not, so you don't have to go back and review it. If it hasn't changed you won't be able to say so much about it. So there are many, many different levels of reprocessing and re-reviewing, and I don't know the answers as to how often they are reviewed in other directories because they don't tell you. I just know that's how we do it.

W: If it hasn't changed in a certain amount of time and you think it ought to, do you then downgrade its up-to-date?

Christine Maxwell: Yes. The up-to-datedness will change but the other elements of what's actually in there won't. That's true.

M: Will its up-to-date rating be faked out by somebody just touching the page [inaudible]?

Christine Maxwell: Well, the answer to that is that if it has changed the date, it will come up for review. But we would look at the site. So you would look at it and you would tell, I mean, if the content were still the same, then it hasn't changed. So the answer is, it could cheat a little bit by actually making you bring it up; but then it hasn't been changed. So that's the answer to that.

Let's go back to the rating page that we had up.

M: Will you say there also is abuse by low-speed modems?

Christine Maxwell: Low-speed modems obviously have an issue with any browser, and that has a lot to do with how much color is showing. That's something that every directory provider, including *Magellan*, has to take into account; because not everybody's got Netscape, right?

M: Does this presentation of data so that it is easy on low-speed modem users cut into your rating?

Christine Maxwell: No, because the problem is you don't know whether someone is a low-speed modem.

M: I'm thinking about 14K.

Christine Maxwell: Right. No, there's nothing there that says — well, that's not true because at the top of them they sometimes say how many K it takes to load, right? So you might have that information, but it won't give you more than that because when there is high graphics... That's an interesting question that you raise, actually.

M: [Inaudible]

Christine Maxwell: Well, most sites actually do give you little bits of information about how many K it's going to take to load something. Go into Maximal and just open www.maximal.com. This is an interesting site because it has a tremendous amount of information. It's about who governs the Russian Federation, and it.... If you come down a minute there's a section called "Hot News" and "Hot Stuff." There it is. Go into Hot News. Now, this is an interesting resource because it shows you, if you know about it, how much information you can get from going down, because this is something that's really going to change a lot.

Right now directories sort of take you to a big blob of information and the key is that, as directories develop, they're going to take you into even more detailed information. For example, here you have some contents of stories that were actually put on Maximal through Interfax news agency in Russia, and if you click on one these stories — let's select "Communists prepare to sue Yeltsin" — you get the story. Then there's this guy here — anyway, click on that. There's his phone number. You can call him up and give him hell. For the first time Russian people can actually get at their bureaucrats. Okay, take it back, please.

M: [inaudible]

Christine Maxwell: Okay. It's a very important question, and what I can tell you about that is that today, catalogs like McKinley's *Magellan* are really intermediate steps between the fact that intelligent agents are just beginning to be around but are still a very long way off from being what they will be in the future. And by that I mean that you can go on the Internet today and there's supposed to be some intelligent agent stuff going on — for example, behind shopping. There are some shopping ["intelligent agents"] where they'll say, "Tell us what you want." [You] put in, you know, "radio clock" and you want it for \$15.00 and it will go out and find the nearest radio clock to what you've asked for. That concept is [one of] an intelligent agent who has taken your idea, taken what you wanted, and has gone off around the Internet pulling your stuff up.

But the tremendous challenge today in the issues of intelligent agents is that you eventually will be able to have your own personal intelligent agent. Instead of going into the McKinley quite in the way you do now, you would say you want anything to do with "Women and Power" and "Politics" and the agent will go off by itself and meet other agents, asking, "Are you carrying power stuff? Are you carrying politics? Yes? Thank you." It will hook it in and keep going and then finally come back with your list for you. The intelligent agents will eventually be

able to do that, but it's a very, very long way away from that at the moment in terms of being able to operate at a level and at a price that we're all going to be able to afford.

M: How are the topic search agents by [inaudible] being coupled with the [inaudible] search engines?

Christine Maxwell: Yes. The question was, really, how are intelligent agents being used, insofar as they can be at this time, within the context of the *Magellan* search engine? If you go into advanced search, this is where you can begin to get a much more focused search going, by filling in those terms there. Let's try something and then we'll do it. You can really focus your search. What's happening with the engine is that it's taking the information that you give it, and the structure by which those words are related — both from a taxonomy point of view, from a linkage of similar words because it does that — and then it ranks it by relevancy at the same time. It's those three elements going across the entire database, so that no matter where you go in, whether you go in under Art and then you suddenly say Business and something else, it will take all that information and build the search on the fly.

The algorithms by which it does that are precisely what differentiates *Magellan* from other types of search engines. PLS, of course, which is its main search engine, is the combination of our taxonomy and the intelligence that we put in there, and that gives the search that we get.

M: [Inaudible]

Christine Maxwell: Harvest is more limited. Let's look at Harvest for a minute.

M: It's in harvest.cs.colorado. They have demo brokers and they are focused by topic area like [inaudible], but they collect indexes from other people and amalgamate them.

Christine Maxwell: Yes, they do, which is some of your question a bit earlier. So does anybody do it all? This does collect and index them but it doesn't obviously have their taxonomy from below it. It can go into their indexes but it can't take the depth of each one. Let's just look at "Demonstrations and Useful Indexes," and let's go in there. Basically these different indexes let you search for documents at another level because they are going by breadth; they're going through a ton of different indexes and pulling it together, but they don't go down. They haven't pulled in, you know, 32K of information on each of those individual ones. Let's try one. Let's go into "University of Colorado." Let's try the search that we tried in the other ones. What was it? Business?

M: Women in Government.

Christine Maxwell: "Women in Government." Let's do that... Okay, here's this issue of "and" and "or" that I said before, missing punctuation, not using quotes. Let's go back and put in some proper syntax. Putting in "Women and Government" would do it.

W: I think it wants a plus.

Christine Maxwell: You think it wants a plus? Try plus. I think you have to spell it out. Let's try.

We've got to get it right. Women should be with a capital. Okay, let's try that — tricks of the trade. Wow, okay. This brings in the keywords and shows you where you'll find references to Women. Let's go into it and see if we can get something out of it.

For this particular one we went into Colorado and that's what we got. If we click on there for a minute, let me just see where it takes us. Like anything else, it's a question of time. You really do need to spend some time on each of these and figure out what they actually have as certain sub-areas. Obviously, if you are interested in looking at core stuff, this is very helpful for you.

M: [inaudible] Harvest brokers is that it keeps you from grabbing stuff because instead the site indexed all of its material and sends you a compressed index, which you can then put in your own index database for about 5% of what it would be to run a whole Web crawler yourself against those sites.

Christine Maxwell: That's a very good point. That issue of bandwidth and the issue of time, that can be a real saver in many different ways.

W: In the Web Week that we just got handed out, they have a mention about *Savvy Search* which was developed by computer scientists at the University of Colorado. It does a "spider" search and it queries *Lycos* and *Yahoo* and *InfoSeek* and displays a list of the combined results.

Christine Maxwell: So they're starting to do that. Should we try that? You'd like to see that?

M: Of all these search capabilities, where do you think the most promising technology might appear? Not necessarily in any one of those, but outside of that, that might change those [inaudible], and this whole thing on the agent side, on this intelligent agent?

Christine Maxwell: The intelligent agents and the development of intelligent agents is the single most — well, there are two things. That's very, very important. The issue of how intelligent agents get incorporated into the technologies of the Web crawlers as they exist now is [important as to] whether changes are going to come.

M: What's the most right now? What technology has the most promise or who might be working on it, in your opinion?

Christine Maxwell: In my opinion, it isn't technology alone that is going to do it, but it truly is the issue of who is combining machine intelligence and human intelligence together to make this come to be the most useful for people. Machines in and of themselves, however good they are, will never be quite as accurate as a human being can be. So really, for example, in *Magellan*, we do a tremendous amount of work to automate a lot of the information that we find, but it's the human being on top of that that looks again at that information and adds additional input that the machine cannot do. Over time comes that issue of trust, the issue of, well, who do you trust? Do you trust only the machine or do you trust the machine plus the professional input on top of that? So I honestly think that's the answer that we go with. We think that the additional input of human intelligence is [important], because in the end you can have technology that can be equally good even though it's done slightly differently; but it is the human intervention that is going to make the difference over time.

M: A couple of quick questions. You've certainly set yourself a pretty formidable task. How many people do you employ to actually review these sites and how many will you have in a year?

Christine Maxwell: We have 40 people right now in our main office in Sausalito, California. We also have individual experts who help us in rating and content evaluation from outside. We are growing very, very fast, and I can see it easily being several hundred within a year because the size of the Internet is so great. And the reason why that is so important — it's not just an issue of volume, it's a differentiating issue which I'd like to say something about because *Magellan* is going to be doing more and more of that.

The Internet is not the be-all and end-all of information. It's very easy to think that it is, but there are major, major databases of content which don't see the light of day on the Internet right now unless you happen to be an extremely savvy searcher. For example, the Dialog databases. Dialog, owned by Knight-Ridder Information, has hundreds of databases which have an archival history behind them second to none. [They have] over 150 individual newspaper databases, for example, and to be able to just go to one place and search newspapers instead of this — I mean, it's a headache and a half. I love many of the newspapers on the Internet, and they are making a tremendous effort to be more useful and more friendly and give you content, but you have to go to the *San Jose Mercury News*, you have to go to the *New York Times*, you have to go to the *Wall Street Journal* — it's a headache and a half. And yet Dialog — at the moment, if you want to search Dialog, if you haven't spent a few years searching Dialog you'll pay through the nose and die off, because you have to know Boolean Logic. You have to know it and you have to know it really well. It's like being a concert pianist; it's not enough to be an amateur pianist, [just as it's not enough to do] an amateur search on Dialog. Even though they are changing the way that they structure their pricing, it used to be on time and now it's on hits. More and more it's coming that way.

But the issue is that you are going to find that those directories that really understand and have the vision to attach content beyond what is on the Internet today are where you are going to see a real change in how directories function. Directories are the beginning, directories are the heart. But the heart of the information of the world is not yet where the Internet is at. The Internet has complementary information, newsgroups have complementary information, and that's why it's very important.

There is one other fundamental difference between what *Magellan* does and what most other directories do. Most other directories are Web directories. That is all they look at, the HTTP sites. *Magellan* looks at ListSerts, it looks at newsgroups, it looks at Gopher sites, so you're getting a much more complete picture. That's very important, because today there are still millions and millions of people who only have access to e-mail; and mailing lists, in my opinion, have got a phenomenal amount of information in them and are far more accurate than most of the Web site stuff that you can get. So that's very important. We think it's very important to provide that content about other types of resources and not just what is on the WorldWide Web.

M: Does *Magellan* have an e-mail interface?

Christine Maxwell: Yes. You can get through it through just looking at text stuff.

M: So you can e-mail requests to *Magellan*, like a search?

Christine Maxwell: Yes. You can send in your own resource to *Magellan* and have it go through its pipeline and stick it in the database.

M: Can you send a query?

Christine Maxwell: Yes, you can send a query. People do send queries.

M: [Inaudible]

Christine Maxwell: mckinley@mckinley.com. It's on the Web site. You can go straight there. We don't have time to answer all of them, of course.

M: So there's not an automated [inaudible]

Christine Maxwell: No, it's not automated.

W: [Inaudible]

Christine Maxwell: Well, they come in every form under the sun, every form and every type of question. Actually, the other point I wanted to make about human intervention is that with *Magellan* we do have a publishing criteria about what goes into our resource, and what goes into our rated area of *Magellan*. We don't rate pornographic sites; those are the sites you're not going to find in *Magellan* database. That's a decision that we made. You can find it on many other things in the Internet, but when you go into there, those are sites we do not rate.

W: Does that mean they may come up under "non-rated" or that they don't come up at all?

Christine Maxwell: They don't come up.

M: You censor it?

Christine Maxwell: It is censorship in the sense that we are saying that's not what — we have a policy. We have a guideline, a publishing policy because we don't feel that that's our place. You can find it on tons of other stuff. It's not censorship in the sense that you can't find it anywhere; we're just saying that's our directory, that's our policy. For example, there's a "Parental Guidelines" piece of software, and I think it's really important that the control over what you see is in your hands and not in the government's.

W: Well, the easy availability of pornography on the Web is slowing down.

Christine Maxwell: Exactly. So, for example, Parental Guidelines is a piece of software that takes McKinley rated information because they can put that in their database and not have to worry about it. That's another choice of yours to make when you go into directories. You can know that's where our directory is coming from on those kinds of issues.

M: [Inaudible]

Christine Maxwell: The e-mail is up at the top. You can say "Feedback" and add sites if you're going to Feedback. We're not set on this particular thing, but if we were you'd be able to go and send information.

Let's go into "What's Hot."

[Tape change]

Christine Maxwell: What was that now? Oh, let's finish that. I knew about it, but I hadn't gone into it yet. "Worldwide Resources, Academic." Click there. Let's just try it. They're coming up out of the woodwork every five minutes. One needs to keep abreast of it, and it's not an easy task. We'll never be totally on top of it, that's for sure, but I don't think anybody will.

Also, I think it's important that you're going to find that in directories, one of the areas that is going to be important in all directories is the issue of user feedback, and being able to take information.

Let's go back to — what's one that we haven't looked at for awhile? Let's go back to *Yahoo*. One of the things that's going to be very interesting is how individual directories use their sites, their actual Web sites themselves, to help users. For example, in the McKinley [browser] you've got What's Hot, you've got News and Weather and Sports, [and those have been] singled out because that's what people look at. There's a constant need on our part, as directories, to pay attention to what people are asking for or where they're going. That's why you're going to see constant changes there.

Something else that's very important that you're going to see big changes in is that as the new level of browsers come up, you are going to see a *Netscape*, for example, and very soon they're going to have a very different frame. On the right hand side there's going to be a frame that will stay still so that you'll be able to have either all the links displayed or you'll have sub-directory information sitting there and be able to change what you see in the picture. It's like a window frame, and that will stay still but what you look at will change. These browsers and the way they work are going to have a fundamental affect on how directories work. It will help directories to help you much more than right now.

We haven't talked for a moment about the RML and all the multimedia side, and how is that going to affect what directories do. That's very important also. You're going to see how to search images; that's a whole issue of the index and the ability to have — I mean, there are pieces of software today that do allow you to see what the links are behind any given page at the time you are looking at the top link, and those are very helpful and that's going to become standard, I think, on any Internet browser very soon.

I wanted to go into *Yahoo*, I think, to look at whether we could do a more complex search with them. Here's how they display how you can make a better search with them. They tell you that you can find a match in the title. Do you want to find a match in the URL or in comment line? Here's this Boolean Logic thing that I was talking about. Here's where you can really get down and get to a more focused search by — if you know the URL you could just stick it in there, if you just know the title you could put it in there. So every directory is trying hard to help you find things quicker than you can at the moment. It just takes some thinking to do this part. It's much easier to just throw in some words and get your first search back; this takes some more patience to actually take the time to go in here.

One of the things *Magellan* does, actually, is it allows you to choose how many lines of information you want to see, that issue of whether you want to see just one line at the beginning or two or three. These are all choice factors, and as the directories become more sophisticated they'll let you do that.

Let's talk about international things for a minute. One of the things that I think is very important is that with the Internet itself — everyone knows it's been global from the start, but the fact of the matter is that initially much of the content was American because most of the resources that were initially being put up were domestic. That's an area where you are seeing that things are really changing, and that you're getting a lot more content from other countries coming up very, very quickly.

There's an issue of the translations and whether automatic translation works. Well, we've looked at a lot of different translation programs ourselves because we're very concerned about the international content and about being able to present content in native language. Unfortunately, those programs don't yet work in the way that allows us to do it easily. It sounds like it should and I've seen many translation programs at different conventions, but they're just not there. They're not there for helping us to make the directory that way easily. So what we do is that we actually make it our business to take several hundreds of resources from France, and those that have already been written up in French because the sites themselves are in double language, and we're focusing on actually writing those up so that there is a base level, at least, of other language content. I think that that's a beginning, but it's only a beginning.

Just go into France, for example. Let's just try. That's another thing that's really where I think you're going to see a lot of interesting developments. People think in many, many different ways and therefore the difference between how you took a directory of information in the past and looked at it — if you look up Internet directories to date that are actually in paper format, there are some major problems with them. Much of the problems come from the fact that when you want to look at some information, if you didn't think in the same way the author thought it's hard for you to find what you're looking for half the time, because maybe you classified "Women" under "Social Sciences" and they put it in under "Health" or something, and you can't find it. Of course, within the context of the Internet, you can do that now because you have a much greater capacity to find things. But just go into any of the summaries, one of the summaries [like] EUNet France. There you are. There's that French issue there. That's going to tell you that if you go in here you will find it available also in French. That's a unique feature of *Magellan*.

The other thing that's important is the audience field. When people think of words for how can they search a site, keywords are not always — sometimes you have difficulty coming up with those. Audience fields are an interesting way of coming at information from a different way because you can think about, "Well, I am a statistician," or a nurse, or whatever. Sometimes that helps you to come with words that are going to help you find what you are looking for.

M: Are those summaries searchable? Suppose I want to find all [inaudible] French.

Christine Maxwell: Yes, yes. You will find it. Definitely.

Let's go into *Excite*. Now, if anybody wants me to search a different directory that I haven't spent time with, I'll be happy to do it. The reason why I'm focusing on these is because they are the most used right now and it gives you a good, broad brush.

Let's just stay here for a minute. Here's a company that does say it does reviews, and I think it's important to look again at how they handle that. Let's just go into "Reviews" for a minute. "Featured Review." Here it's featured one particular one. It talks about "Book Stacks" and it tells you what it is. Now that's a genuine review, in my opinion, because it actually does tell you about it. Let's go into one of their categories. Let's try "Lifestyles." It's quite helpful that they have individual things underneath it. They feature a review so they've chosen one out of all

the ones that they have done. They don't tell you why they've featured it, they've just made a selection. So here they're giving you short amounts of information. Why don't you go into "Howard Reingold," for example, and let's look at — they just say he's the editor, [and he] passes along his thoughts.

One of the tests that I think tells you a lot about how accurate reviews are is to go into your favorite site and just try each one of the directories that you focus on and look at the differences, because that tells you more than anything. I mean, I'm just showing some examples, and I know each one of you could come up with your own. A lot of the issues about what you choose to use has everything to do with what your expertise is or what your work is.

I did talk a little bit about America Online and CompuServe. I didn't say very much about them, but CompuServe, for example, has thousands of forums, business forums, that are very, very good. They're not available on the Internet and so you are going to miss out on the information if you don't belong to CompuServe, because you won't be able to get it.

So there is a lot of homework to be done in terms of really trying to assess which kind of directory, which kind of planet of information is going to have more of what you yourselves need. I'm not saying to you that any of these directories necessarily match everything that you're looking for, but I would say that one or two of them will probably meet your needs faster and more accurately than others, and that has everything to do with how they're put together.

M: Do you feel that in the future CompuServe and America Online are going to be obsolete in a way, because they're going to get so much pressure? All this stuff is free, and they're charging. What is your perspective on that?

Christine Maxwell: Right. Can you see if you can put *Pathfinder* up in the meantime? The question was, do I think that America Online and CompuServe will actually become obsolete because there's so much free information out on the Internet itself? The answer, I believe is...

M: Obsolete is a strong word.

Christine Maxwell: It is a strong word.

W: [Inaudible] what they add to their product?

Christine Maxwell: I think it depends on what they add, because the issue is what information they have that is unique to their service. That is one question. What is so attractive that people will keep coming back? But you've got to remember why people go to AOL. After all, it's a lot easier for many people to start with one of the services because they don't really have to figure out all the problems of how to connect, and what's a PPP, and [what's a] shell and a god-knows-what. That's really still a big, big problem for many, many people. So going to AOL is an easier step.

Now, the problem for AOL today, as it is for CompuServe, is not initially how to get a client, how to get a customer, but how to keep them. Customer retention is by far the hardest thing for them today. So what do they need in order to keep their customers happy? They must ensure them a really successful search experience. If they don't get stuff, if they keep clicking and then they go into something and it's not what they want and they go back out, that issue of wasting time or saving time is very, very important. That's where a really good directory has a focal point to play in the success of America Online, etc. Those companies that don't have really strong directories have got a real problem. Look at eWorld, for example. eWorld has got

a lot of catching up to do because it doesn't have a lot of content; it doesn't take people a lot of time to work their way around eWorld and then they want to get out. That's a challenge for them at this time. If you go to GNN, Global Network Navigator, there's been a lot of talk about — actually, it's part of AOL.

Can we put up a new window for a minute? I'm going to come to *Pathfinder* in a minute. I like to look at that a lot, actually, because it's so successful as a site at this point and I think there's a lot that we can learn as directory from that, and, a lot that you can also learn.

GNN prides itself on selectivity. It has about 12,000 sites that it has reviewed and evaluated. It's got a brand new look today; it hasn't been up very long like this. It's got some interesting... That's the whole Internet catalog; that's where they have their catalog, and they've got different features here. Here's how you see what different catalogs are trying to do to attract people and to keep them. They're changing the features here.

M: Like a newspaper.

Christine Maxwell: Exactly. It's getting more like a newspaper. It's pretty interesting. Let's go into their catalog for a minute because I think it's important.

W: What is the GNN map?

Christine Maxwell: Let's try it again. I tried to get in this morning, but couldn't. Great, we are getting in. [The categories that come up are] What's Up About GNN, GNN Voices, GNN News. So it gives you a bit more of a breakdown as to how it's organized.

W: Do you have to pay to use it? What does "Join GNN" mean?

Christine Maxwell: Where is it?

W: It's in the upper left.

Christine Maxwell: There we go, bulls-eye, sorry. Okay, you can become a member; if you want complete Internet access, blah, blah, blah, because it's part of AOL. But let's go back to the catalog just for one minute to see what they've done with it. They've also gone into — they have a "Best of the Web," where they have taken all their reviews and they are kind of giving it an Oscar rating or something.

[Then there's the category] "The Worst of the Web," yes sir, it's the worst of the Web. Well, the only reason why I bring this up is because what they've done here is rather than get you straight into their own catalog they've given you other places to go. So it's a catalog, but they're going to other catalogs, right? They've kind of, at least on the surface, opted out of their own. And in a sense, Point Communications, now that it's been enveloped by *Lycos*, hasn't yet put themselves together.

I think the other thing you're going to see over the coming months is this alliance stuff going on. It's going to go on fast and furious for quite a while, and the reason why that's important is because there is so much information out there. So it's very important, actually, for catalogs to look at what kind of alliance is going to help them give a better product to you. That's what it's all about, it really is.

Let's look at *Pathfinder* for a minute because I think I'm going to end on that as a sort of — it positively gives you indigestion, it's got so much information.

M: [Inaudible]

Christine Maxwell: In our context, the reason why we review sites, and how we make the selection, is this. We first of all use our machine intelligence, which is based on our human intelligence in the first place, to pull information and to pull resources in. So we're already making a selection process right there. When those resources come up they come into our — we call them "information buckets," so that "Arts and Education" will already be in the Arts and Education bucket by virtue of the way we have constructed our system. Then cyberwriters, as we call them, are the first step in the evaluation and writing process. They go into each site and they literally review the entire resource.

Now, the issue of whether they decide to write something up or not has a lot to do with many different factors. For example, if something is totally under construction it's not going to get written up at that time; it will go into the re-review process in a month or something like that. Or the Home Page itself might be thoroughly uninteresting but once you've gone down three pages, then all of a sudden there's this marvelous page there about chemical research or whatever. So that one would get written up. That's the difference between a human being doing it and just a machine. If you put in the word "hate" — I remember doing this search, it was quite a while ago and I did the search on hate in *Yahoo* — and I got "Chateau La Jolla Hotel" as the very first thing to find. Now that really shows you how a machine can go wrong if a human being doesn't look at it.

M: Is that part of the technology used to pull that in [inaudible]?

Christine Maxwell: Yes. Now with *Pathfinder*, this is the site that gets 15 million hits a week, and if you go down a little bit further there's something which says "List All Our Databases." Now you're down here a bit further and each one of these, of course, represents one of their products and we can take our pick. Let's go into "People."

Okay, here's *People* magazine. Now, what's interesting about that is that you can, if you had gone in — what would have been great, because remember *Pathfinder* is just so enormous, is if you could have just put in "Princess Diana" and it would have been great for you if, in fact, that had just come up as immediately as one of the selections [that came up just] because we just happened on it. With "People," well that's a good guess, you know, she ought to be in there. You can do some sort of educated guesses about where things are but you haven't got a lot of time, and that's a lot of educated guessing that you're going to have to do.

So the key, really, is how are directories themselves going to be able to help you find that right off the bat? The only way they're going to do that, actually, is by alliances, alliances with content providers. The big content providers, Time-Warner for example, are the people with who you're going to see a very different ownership of directories, because little directories can't survive by themselves. The [directories] don't have content; they just catalog resources on the Internet. That's a beginning, that's not an end. Where those alliances are going to come — the alliances where content comes from directories on the Internet — are what I think is going to make directories much more helpful and much more able to burrow down to content and give you strong article information just like Dialog does.

I come back to Dialog again because in my information days under Research On Demand — that's what's so interesting about [the state of the Internet] today; for 25 years, the cutting edge of information gathering was the on-line databases. It was Lexus and Nexus, it was Dialog, it was BRS, and now those tools are conventional tools in our database, in our searching. What is the front end or the cutting edge tool now? It's the Internet.

There's another tool which has immense importance within the context of the Internet, but you don't see it yet. You don't see it playing that role yet, and it's called Geographic Information Systems. It's an enabling technology that you see a lot right now in map-based marketing. Map Info, for example. The best one is put out by ESRI, the Environmental Systems Research Institute in Redlands, California. They have a system called *Ark Info*. Anyway, that technology essentially allows you to take pictures — it's like having a pictorial spreadsheet and it's an absolutely fascinating technology.

W: I don't get the connection.

Christine Maxwell: What I'm saying is that at the moment, what's happening here is that this is all relational database information, right? And the search engines are based on relational information; but that image aspect, being able to take pictures and also relate pictures and text together, that's what the GIS does.

When you build a geographic information system you have to geocode the information, and the issue of how you geocode it allows you to relate any kind of information whatsoever and bring it up on a map.

M: [Inaudible]

Christine Maxwell: Right. But I mean, here's the hotel. It isn't just a question of showing you a nice map all around that you could actually attach all kinds of information to and could see very in-depth content coming up on. You know, you would say, "inside that building it's got Xerox Park," and then you click on Xerox Park and it shows you. I mean, you can build and build levels of information, levels of image stock.

W: You could say that rather than a map you could use a different kind of image.

Christine Maxwell: Yes. So I'm just saying that the virtual reality and all the multimedia aspects of content on the Net that you can get now — and it's going to become even more visible as the Net progresses — is an immense challenge for directories because we've already got enough information right now, [so much that] we're drowning. How are we going to deal with those? Well, unless you use a technology like GIS you won't be able to do it well.

M: Are you guys working on that technology? Are there other companies working on that?

Christine Maxwell: The companies who have worked in GIS, of which I've mentioned a few — that's an area where, like everything else in life, I think you need to work with the companies who have that expertise. GIS is a very formidable, enabling technology and you need a tremendous expertise in it. But how you use it in the context of the Internet is going to be very interesting.

M: [Inaudible]

Christine Maxwell: ESRI stands for Environmental Systems Research Institute in Redlands, California. Map Info, they're up here. I think they're in Mountain View. Etak belongs to Rupert Murdoch.

W: [Inaudible]

Christine Maxwell: Atlas uses GIS in a format, but they don't have as robust an enabling technology. The robustness is terribly important, actually, because we're taking about such a volume of input.

I think the other thing that's critical when we talk about the interactive aspect of the Internet [is that] every single one of us here has a role to play in how the Internet is going to progress and whether it answers to your needs. It can only answer your needs if you really help to express what your needs are. It's a bit like voting.

Not only that, the architecture of the Net or how the Net gets built up — you know, just because it started the way it did, by being very volunteering and so on, that's an aspect of the Net that all of us have really gleaned a tremendous amount from. Just because commerce has arrived doesn't mean that all the good things that the Internet started with will go away; I don't think they will. The sharing of information, that whole aspect is something that I think the Net will always have.

Right now, when we talk about the WorldWide Web, we talk about the ability for anybody to literally hang out their shingle and say, "I am this, I am the best sweet shop on the Net, I am the place where you can get the best information for how to deal with your teething baby," or whatever it is. You can be that. Because it is as simple as literally setting up your Web page, then you yourselves can have just as much input on how to make standards happen. One of the things that I hope is finally beginning to change is that when people first started putting up Internet resources it was almost like somebody wanted to be in the Guinness Book of Records for the amount of links they put in there. It was awful. And you still get that a lot, so you lose complete sight of why somebody started their Web site in the first place.

It's very hard for directories to get it right in that context because people are so over the map. That's where the control issue comes in, really. After a while you have to take some responsibility. If you're going to put resources up then you've got to try very hard to put yourself in the role of those who are going to use that resource. That's what *Magellan* itself truly tries to do in every way, shape and form. It's not only to think about how to present information so that you will find it easier, but to think very carefully about covering every type of information and any kind of individual, whether they be from anywhere outside of the world, or from different cultures, different abilities, different age groups. All that is really important because the Internet is really a place for all of us.

So the directory does try to be something for everyone; that is its role because it's trying to be as comprehensive as possible. It's trying to include all of the areas of the Internet, in terms of different tools, etc. Can you get it just through Gopher, can you get newsgroup information, can you get FTP information? We think you should be able to do all that in a directory.

The one-stop-shop is where your intelligent agents will come in over time because it will be your personal intelligent agent. But until that time you do have to rely on directories. I think we have a big responsibility as a directory publisher to try to answer as many of your needs as possible. So the more you can let us know what your needs are, the better we will be able to serve you.

Anyway, I think that's where I'm at today. Any more questions? I'll be happy to answer them.

I have one other thing which you might like to know. This is the *McKinley Internet Yellow Pages*. It's actually the third edition of *New Writers Official Internet Yellow Pages*, which I co-authored. It's now called the *McKinley Internet Yellow Pages*. Why did we do that? We did it because we still feel that there are millions of people out there on the Internet — sorry, not on the Internet — who have not yet been on computers or are just starting the Internet, and it's

really important to help people have a way to know why they're going on the Internet, to help people to find resources so that they themselves can say, "Gosh, that's why I'm going here. I'm going here because I want to look at this resource," or "That speaks directly to me."

That's another thing. It's a complementary area, a reference book like that, and I think for a long, long time to come there still will be a need for different types of content in different formats. CD-ROM, of course, is a very big and very important area. Japan is a particular case in point where they have such difficulty with current connectivity. CD-ROM access to directories is very important for Japan more than anywhere in some ways right now.

M: Do you provide [inaudible]?

Christine Maxwell: Yes. Actually we have a CD-ROM coming out within a couple of months.

So, anyway, that's a small, quick tour of the Net and I hope I've answered some of your questions.

TUTORIALS

C++ TECHNIQUES FOR BUILDING COMMUNICATION PROTOCOL LIBRARIES



SPEAKER

Michael Baldwin

President, Dart Communications

Michael Baldwin: Good afternoon. My name is Mike Baldwin and welcome to "Tutorial 3, C++ Techniques for Building Communication Protocol Libraries." I understand we have one developer who's developed to the WinSock specification and, [since] you're probably already an expert, I'll be doing a talk on that tomorrow at 1:30 for 2-1/2 hours and these gentlemen over here? Berkeley Sockets? Were you on a PC platform or UNIX platform?

M: [inaudible].

Michael Baldwin: Okay. That's cool. My name is Mike Baldwin, like I said. There's my e-mail address if you'd like to correspond with me after the show. We have a WorldWide Web page called www.dart.com and the reason I was asked to speak today is because I've been in the business of building TCP/IP applications for a little over five years. My first experience was in 1990 using the [inaudible]. TCP/IP network interface card that had TCP on the card. My company commercialized the first WinSock TCP/IP protocol library in February, 1993. Those familiar with the WinSock specification know that it's just about the time, it was actually January of 1994 that the WinSock 1.1 spec became finalized, but we participated in that specification.

Our company, Dart Communications, has a line of communication libraries called Power TCP that were first released last summer, and we first implemented C++ class libraries, DLLs and VBXs for Telnet and TCP. Those, of course, were WinSock compliant libraries and today we've moved right along and now we support FTP simple mail transfer protocol, POP 3, UDP, VT-220, TFTP and SNMP and these are all based on our C++ class libraries, so the architecture of our products are C++ classes up to a particular point and then if our customer wants a C++ class library they take that. If they want a DLL we slap on a DLL interface so that non-Microsoft compilers can interface to it, or if our customer needs a VBX or an OCX we [inaudible] link that interface right onto the class library so the same underlying code forms the basis of all of our libraries, and I would certainly recommend that architectural approach to anyone who's building communication libraries.

M: [inaudible].

Michael Baldwin: We do not have an HTTP control because we do not feel that there was enough value-add there. There are Web clients that do the visualization which is the most difficult part, the visualization. The HTTP protocol itself is changing so rapidly it would be hard to standardize in a particular version and it is moving so rapidly that as soon as it would be released it would be obsolete because there would be 3.0 then there would be the Netscape extensions, etc. Our TCP library would allow anyone the mechanism to connect up to the HTTP port which I believe is 110 then interpret the data that is sent back and forth.

Gentleman, [please] felt free to speak. Please, we've got a small group here. Whenever you've got a question that's relevant, please we'll address it as we go along.

M: [inaudible].

Michael Baldwin: Yes, they are. There's a market forces issue. Although people have asked us about UNIX versions, our experience has been it's expensive to maintain the libraries across so many platforms, we would be forced to distribute source code which we have chosen not to do. We have found that many UNIX shops are more than happy to climb onto existing source code that's available freely on the Internet, so there wasn't as much [of a] market for us.

M: Let me ask you one quick question. Your [inaudible] classes, those are actually, you're standardized on [the] WinSock API, so those classes actually work... you have the TCP/IP layer and then WinSock represents [inaudible] then all your stuff sits on top there?

Michael Baldwin: Yes, sir.

M: So if I link your SET library for a class into my program, then my program will still function with any other WinSock.

Michael Baldwin: That's right, and it will run Windows NT, Windows 95, Windows for Workgroups, that manages stacks distinct, etc.

The goals of the session today are very much C++ related and oriented. Tomorrow's goals at 1:30, I've got the same slot in the same place, perhaps I'll see some of you here, tomorrow's goals will be to talk about the WinSock interface, the WinSock layer, more tools-oriented, standards-oriented. Today we're C++ oriented.

The mechanisms that make C++ such a very nice model for us in the communications world is, number one, class specialization. For example, if one builds a TCP class one can derive a Telnet class from TCP and incorporate the Telnet functionality without touching any of the code in the class library for the TCP library. So we have found that to be of great benefit, [so] that when we locate an interoperability problem with a vendor's WinSock stack then we [can] provide the fix in a low level base class, then that fix propagates throughout our entire product line.

Encapsulation. Kind of the flip side to class specialization. Encapsulation is where instead of deriving from the class you put an instance of that class within your class. In some places in the communication area, FTP or file transfer protocol is appropriate for doing that type of thing.

Virtual functions for event notification. Probably the most interesting and positive aspect of using C++ class libraries is that the base class can define a virtual function that is either pure virtual or not, that is meant to be overridden by the derives class or your class. So, for example, if the library would like to notify your class of an event or received data, then it can call the receive event and it just naturally gets called right in your user class or your derive class so that you can just handle it right there in your class, so you get notified of data so it's very event driven. It can also be used reciprocally in that the base class can find out the information from any derived class by using virtual functions or defining a virtual function where when it's called you provide a response. In both techniques you'll notice if you go to MFC libraries for example and see how those libraries are used to communicate windowing information to and from your derived class.

Those are the goals. Now, how are we going to do the goals? In Section 1 we'll have a review of C++ mechanisms, the specialization, encapsulation and the virtual functions that we just described just to reinforce those points. In Section 2 we'll apply those mechanisms to communication software development. I'll be using our class libraries and some of that code for

demonstration purposes. Then Section 3, I'm hoping that we'll be doing a live Microsoft Visual C demonstration using our libraries, if we can get the network interface issue resolved here.

M: [inaudible].

Michael Baldwin: I'll be showing the design of the libraries and if there is a particular implementation feature that you would like to see, I've got the make files with the source code all right here so we can review them quickly.

I debated whether or not I should bring my source code to show everybody, you know, trade secrets and all that stuff, but I'm not too worried.

M: [inaudible].

Michael Baldwin: Well, not so much that as deciding to do it. I thought it would be a very unique opportunity for those here in the room to see how professional level libraries are manufactured. The first time I saw the TCP/IP networking code that a Microsoft engineer showed me about three years ago on his PC, I was just so impressed. Oh, that's written in just regular old C? I can understand what's going on here. So I just kind of want to take the mystery out of it here.

Class Specialization. Okay, here I've illustrated a very simple situation where two class libraries illustrating double inheritance are shown to bring capabilities into your user class, so if we look here at the bottom we have a user class called class user terminal and let's say that's a Telnet terminal that you'd like to write. The way we can use class inheritance to its very best capabilities is to derive both from our communications class and from a viewer or a user interface object. So here on the left for the sake of additional information I show a base class called Power TCP and then when we derive from that class a Telnet class which basically splits the stream up into commands and data and then provides that information down to the user class where a couple virtual functions, bodies, are defined on the part of the user.

On the right side, I didn't want to show the entire MFC hierarchy, but C edit view would give you an edit window and you can derive from that so that when you don't need to specify, for example, if you gave it a name using encapsulation it would be within the class definition, you have C edit view space my terminal, or something, my edit box. Then down there in user class you would have to specify the edit box whenever you wanted to put something in it. But when you do multiple inheritance like this, you are in [the] edit box and you are a Telnet connection.

M: [inaudible] using multiple inheritance, what would be the design advantage using that instead of, for example, [inaudible] user terminal, for example, didn't have a dedicated Telnet protocol. It seems like it would be more flexible if instead of using [inaudible] inheritance, I mean, that way you're not [inaudible].

Michael Baldwin: I see, this right here is assuming that you are making a Telnet terminal, so it is not that flexible in that you can't swap different communication streams for example. So you really are hard-coding in a Telnet terminal that has the features ... so you've married these two features. It wouldn't work using a commercial library to go MFC class C edit view and then inherit base class Power TCP because in our commercial libraries we don't show C edit view as apparent to drafting that, so you couldn't do it that way. However, if you were building something yourself, it would be perfectly acceptable to put everything all in line.

M: [inaudible].

Michael Baldwin: The next slide may illustrate [inaudible] a little bit better then, perhaps, we'll come back and contrast the two views.

Using encapsulation you can do exactly the same thing. You can derive your user class from our base class, I left off the TCP class, and then using encapsulation you could have a C edit view terminal right in your user class. I think some C++ purists would say that they really like to have the object of the previous slide comprised of both. Others would say that, well, for simplicity reasons they like this approach; however, when you do it this way you're more of a switch. Your user class becomes more of a switch. It's switching data from itself, if you thought of it primarily as communications, the user Telnet, when data came in it would say terminal.cell text = or however it does it. Using the previous mechanism you would just say cell text = data, so you eliminate the reference to terminal.

M: [inaudible]

Michael Baldwin: Why not?

M: Well it doesn't seem [inaudible].

Michael Baldwin: Why not? We're pushing the paradigm. This is thinking about things a little bit differently. How many people would, how many software designers would implement communications as C++ class libraries?

M: [inaudible]

Michael Baldwin: Okay. Then why, just to go back here to this slide, an instance of the bottom class there that's a Telnet terminal and a Telnet terminal, if I was to think of a piece of hardware, basically handles the communications and displays it and sends the communications out.

M: I would say, using a communications channel [inaudible] and using a keyboard to get it, but it is not a keyboard. That's my taste, you know?

Michael Baldwin: You're right. It's personal taste and I think there is more than one way to skin a cat. I've got a ...

M: That's one way to skin a [inaudible].

Michael Baldwin: From a personal point of view, I've got a very talented young man, a C++ programmer, when he discovered that he could do this he got very excited. Paul is like that. You get excited about C++ technology, whereas in my first go around with communication libraries I actually did take the approach that you [went] as far as the data communications channel and it was more of two things talking to each other. It was not quite as elegant and not quite as clean, but you can certainly do it and implement this both ways. I will in a couple slides, we'll talk about where encapsulation perhaps makes more sense, where it has to be done that way.

Virtual functions for derived class event notification. We're going to start getting into the code here. A base class describes a virtual function called "receive event" and it points to

data and it describes the length of the data. It could be a virtual function if we put a little `=0` there at the end of the function, it could be virtual, and then you would force the derived class to always to provide the member. Then in the derived class we have a receive event that is completed within the C's or Telnet class and in that class you simply provide the code of what you wish to do with that data. So it's a very proactive type of design. There are other types of designs that give one a signal and then, the WinSock programmers here would know that, you get the signal that there is data received and then it's up to you to allocate a buffer and read the data into a buffer in order to utilize the data and the design of our class libraries basically implemented that within the library and then provide a pointer and a byte count [of] the data to the application. Very proactive, event driven.

Virtual functions for base class queries. Well, when you build it yourself, a set of libraries comprised of building blocks like this, you may have a need to get a type or find out what the type of the derived class is. So here is the mechanism, kind of in reverse, that in a base class, and our C WinSock class is the bottom most class that we use, we have a virtual function that returns a type of protocol and then down in our drive class, our Telnet protocol, it returns our Telnet type. So that's a mechanism for doing the opposite or reciprocal. So, in one mechanism we're volunteering data to the user class and the mechanism we're asking the user class what protocol it's using and we make it a pure virtual function so that at compile time we can check for any errors or any failures of that occurring.

M: Is that just a demonstrator or would you actually change the behavior of your base class [inaudible].

Michael Baldwin: Actually we use it for a licensing mechanism, because our product is licensed on a protocol basis so we want to know what protocol the user is exercising. That allows us to place all of our core technology and licensing right in a base class, [at a] very low level. It certainly has other purposes too. Any time that you want to know information about a derived class.

M: [inaudible].

Michael Baldwin: Yes, we just have an enumerated for each protocol type but this is just illustrating the technique. For your own application you may have a need to query the end user class for information, for whatever reason.

M: [inaudible]

Michael Baldwin: Yes, our libraries are half of our customers are like OEM customers, so the way we do that, they say what protocol they want to use and then many of them are using our C++ class libraries and statically link.

M: [inaudible].

Michael Baldwin: Our libraries are just, the C++ libraries are statically linked as I'm sure all of you are aware so they'll link right into your application and then the linker works, it just takes the code modules that it needs to link to, so we just do it for a packaging mechanism. Like, for example, our TCP libraries cover TCP, FTP, Simple Mail. POP 3, and Telnet and then when it, since it's just in a .lib, when our users link into it, the actual source modules that are actually utilized are linked in and none of the others are.

M: I was just wondering that if you are using this type of mechanism [inaudible] what happens if I inherit another class [inaudible].

Michael Baldwin: We just make it hidden, it's just removed. There's a technique that you may find useful also and that's one of the fundamental problems from my point of view on C++ is that if you do a straight derivation of classes, you have to include the header files for everything, and that's not appropriate for a commercial-level product to force a user to link with all those header files. So what we do is we do an encapsulation mechanism so that we have our exposed environment that I'll show here in a couple of slides. Then we have a reference to a low level TCP object that has the C WinSock class and has our TCP Sock class. So, since it's a reference or a pointer, and that could be a reference or pointer to anything, we have no need then to distribute the header files for all those base classes which makes our interface cleaner.

That's a very good question. It took me a while to understand that particular limitation of C++.

We're moving along very nicely now. In Section 2 we're going to talk in more detail about the application of C++ mechanisms to communication software development which is the real meat of the story here. I am the developer of all of our libraries and it was non-trivial. The previous product, TCP++ being the precursor, gave us the opportunity to give it one really good try and then a chance to reinvent it. We're going to talk about the protocols here a little bit, too, as we have to before we can talk about the actual software and show pictures of that.

The transmission control protocol. This isn't so different from everything else out there. The marketing going on right now. We'll talk about that at the break or something. TCP is connection-oriented. That means you have to set up the connection like on a telephone. You have to ring the number, the connection happens and then it's point-to-point. That's the only thing it has in common with the telephone. After that it has nothing. But, that is what connection-oriented means.

M: [inaudible].

Michael Baldwin: It's going to be on the CD-ROM and I do have . .

M: [inaudible].

Michael Baldwin: I don't have a script.

M: Based, as far as I understand, on the CD-ROM, they are going to record you and then tie it into the CD-ROM what you are saying and also what I am saying, but would it be possible to receive the [inaudible] of these transparencies using [inaudible].

Michael Baldwin: If you've got a floppy I could just give it to you, but yes, either one.. If you e-mail me and just request the Power Point demonstration, I'll send it over.

A stream means that, it's kind of like no beginning and no end and it just moves along and so you don't know when the data is going to arrive or, actually, when it's going to leave, so it's really stream communications. It also implies there's no record blocking so as the stream moves along it's now blocked up into chunks.

M: There are no frames?

Michael Baldwin: There are no frames. Not that you see. There are frames underneath, but not that you see at this layer which kills us sometimes. Our technical support calls and the guy says, "Man, I sent out 200 bytes, 200 bytes, 200 bytes, 200 bytes and all I got back was the first 200 bytes. That's all I got back." And then your working with tech support, working with tech support and finally comes to find out well it all came back it's just that it came back as a 1,000, right? All in one chunk. He was just assuming, well, if you sent out 200 you get 200. No, it has a tendency to either group or fragment during the transmission and it can do either so you can't depend on that. It's also characterized as bursting communications. Telnet's a good example. You press on a Telnet key, one key, it generates about 40 bytes of header information and one ASCII character and it goes out in the network. If you're doing an FTP transfer it could be several thousand bytes or a megabyte very quickly and saturate a choke point but then it's gone, so that's what bursting means.

M: [inaudible].

Michael Baldwin: We do. It's an option for setting the connect; however, I don't believe it, the no wait option disables Nagle's algorithm which is explained in TCP/IP networking books as if you send us a couple little characters along, the Nagle's algorithm may decide that it will group them up for one packet [inaudible] the network. But on all the WinSock implementations I've seen, although that option is there, I've never seen it. Or if you send a character, it doesn't go. It always goes and I've never found one that didn't as default because when you think about it, so many applications use WinSock for Telnet emulator-type work. When you send a character, it's got to go otherwise just nothing happens and the host always echoes, I mean, typically with a terminal emulator that you'll see, so you want to see that character back on your screen as soon as you hit the button.

Reliable end-to-end communications means that what you send down the pipe is guaranteed to be received in the same order. There's no guarantees on time, but there is data integrity checking and unless you receive an error indication on your end, the WinSock specification says that we have every right to expect that it reached its final destination.

Quick word on two types of connections. An active connection means that there's a client, like an FTP client or a VT-220 client, very typical, makes an active connection out to a host and then what happens at the host, if it's a UNIX host, it accepts the connection, spawns off a process to handle that connection and you're off and running.

A passive connection is where a server accepts that connection and that's available on the WinSock side too and we've built that into our TCP library and our Telnet library so both can be utilized to accept connections on any port.

M: Were you concerned to ringing or dialing a number and answering your phone? Is this [inaudible] analogy?

Michael Baldwin: Yes, that's the analogy. It's ringing the number, other guy picking up the phone and you've got a live connection going on, that's when you're connected. Then data can go back and forth. Then when one guy hangs up the other guy gets the dial tone and knows he hung up, usually.

M: [inaudible].

Michael Baldwin: Well, there are time-out possibilities on establishing a connection that's typically dependent upon the WinSock stack that you are using. What I have seen is typical is

that a connection request will go out to that port and then a 20 second timer is initiated and if there is no response within that 20 seconds it might send out a second one with a higher priority on the IP packet and that's supposed to help it get through routers and congested conditions and then if that one fails, we see the WinSock errors that there is a time-out.

M: [inaudible].

Michael Baldwin: In our classes we have a time-out available on a listen function and in our classes the listen function is called that because there is a WinSock listen and parameter is the number of seconds to time-out and when it's called, it's listening for a connection for as many seconds as are specified or indeterminately, and it's a good question for the FTP protocol, because with the FTP protocol there is a control connection and then there's a data connection. The way it works is the control connection connects to the host, starts a listener when it's time to move data or get a listing, starts a listener, and then tells the host, "Connect to me on this port," and then do it. It connects to the port and it's a good example of when a time-out would be convenient because you may only want to listen for 10 seconds or 15 seconds and then have it just automatically go away.

M: [inaudible].

Michael Baldwin: Yes, that's right.

M: So you're blocking during that time?

Michael Baldwin: No. Well, since you bring it up, I don't have it as part of this talk, but we'll talk about blocking for a second. The question is: were we blocking for all that time? There are three types of communication, how shall I say it, software mechanisms here. The first type is called a blocking synchronous mechanism where you'll disappear into the function waiting for something to happen, any event of importance. It was used widespread ...

M: [inaudible].

Michael Baldwin: Yes, sir.

M: Definition of blocking?

Michael Baldwin: Yes. How about if I do a quick change here to Tutorial 11.

M: [inaudible].

Michael Baldwin: This right here is tomorrow's 1:30 talk, and it's on my diskette so you'll get it on the CD-ROM. I'm going to drop it off with [the CD producers]. Software 101. Synchronous blocking functions. They capture your thread and return when the function is successful. That's the way communications was done on a UNIX because you had very nice multi-threaded, multi-tasking support under UNIX where you wouldn't interfere with anything else if you were doing that. So [in] a typical connect, for example, you could basically do a blocking connect into that function for a second or two and other things would still be happening on that machine; however, there were some problems there to do that under DOS or Windows.

Asynchronous, non-blocking function is one where you capture a thread but you return quickly whether you're successful or not. So under DOS that would be typical, if you were to write a RS-232 application under DOS, not under Windows but under DOS, you'd be stuck doing some type of polling mechanism seeing as the buffers fill and if you were to go to LAN Workplace for DOS, for example, who has a Sock library, that's a typical default behavior for that library. LAN Workplace for DOS that was bought from EXOLAN back a couple years ago that was one of the few ways you could program TCP/IP at that point.

With the development of the WinSock specification, asynchronous is Windows trademark, right? I mean, asynchronous, event driven, so the synchronous blocking function was quite bad, disappearing into a Windows call for a second and if any of you used Eudora's mail program, for example, when the hourglass comes up, it's an asynchronous blocking call. And that's typical of many programs that reported into the Windows environment from programmers who had code that was synchronous in nature, meaning that step 1, step 2, step 3 right in the code, okay?

The asynchronous non-blocking functions are the way to do it in Windows because what happens is you set the function, the connect or the send into action and then it will tell you when it can accept more data or after the connection is successful, so it's an event-driven mechanism. Our professional-grade libraries have to use completely non-blocking functions because it's an anachronism of the Windows environment in that only one blocking function was allowed at any one time, so if you ended up with application A using a blocking using a blocking function and application B using a blocking function, B would typically fail because the WinSock layer said, "No, no, no! I can't do that. I'm already in this peak message loop down here doing work."

Think of the answer to that a couple days ago when it came up and I don't know. I know it has to be the case architecturally for Windows for Workgroups, but with this machine here and Windows 95 and Windows NT, I'm not sure, it's still in the spec, but I'm not sure if the actual limitation exists. If one were to test it, but [this is] still, I guess, the only place I might say were you could live with that is if you're under Windows NT and you spawned your own thread. I mean, if you wanted to do it that way, but it's probably just as easy to go through the lowest common denominator which is completely event driven and just forget about the availability of synchronous blocking, or polling, for gosh sakes.

M: [inaudible].

Michael Baldwin: Yes. A blocking function would be if the default behavior on the WinSock specification, if you call connect to a particular address, the function will return after the connection succeeds or does not succeed, okay? And if you're trying to connect to a host in Australia over many links it could be a matter of 5 or 10 seconds. The synchronous non-blocking function does the same thing. You could mark the socket as non-blocking, call connect and it says [inaudible] call connect [inaudible] and check back every half second on a timer until you've succeeded. So that would be the polling mechanism. And with the asynchronous non-blocking mechanism would be, request a connect in a couple seconds, your Windows procedures called with the appropriate message that says you're connected now. So those are the three communication mechanisms all supported under WinSock.

M: [inaudible].

Michael Baldwin: Not really. Synchronous means that ...

M: [inaudible].

Michael Baldwin: That's synchronous blocking, but synchronous non-blocking is when you have to make the call but like you get an immediate indication so it comes out. It goes in and checks, then comes right out, so that requires a polling mechanism. And then the asynchronous comes in when you don't have to check and you're informed.

This is what in the TCP world has to happen to accomplish a connection, although you can take your pick on other protocols, too. Create a socket, something to talk to. Bind it to a port address pair. Set options and notification choices. Launch a connect request. There's another step you may have to asynchronously resolve a host name to an IP address, okay? That's what happens. And then if we're doing the asynchronous, which is what we do, we catch notification of success or failure and then you're clear to send or receive data according to the upper layer protocol being implemented. Examples of upper layer protocols are R-Shell, R-Exec, R-Log-in, Telnet, FTP, HTTP, all the products out here on the floor are based upon TCP for the most part, let me say 98% and then close the connection. And since it is a connection-oriented protocol, when one side closes the connection the other is informed of the connection closure.

M: [inaudible].

Michael Baldwin: Yes.

M: [inaudible].

Michael Baldwin: Yes.

M: [inaudible].

Michael Baldwin: The way it's implemented, let me hold the question for a couple slides, or one slide.

This is the definition of our TCP stream class and I'd like to talk about it from a design point of view, but it's really what most of this stuff is, I mean, once you get the design down, the coding just goes along. So with our C Power TCP class, the protected functions shown at the top are all virtual functions and we'll go through them one at a time here.

M: [inaudible].

Michael Baldwin: No. We do have a line of UDP-based classes that inherit from a UDP object.

M: [inaudible].

Michael Baldwin: Yes. Yes. Yes. Connect event is called by Power TCP to inform your application of a connection and the reason it has so many parameters is that it's the mechanism to find out what the remote dot address is of who you're connected to, the remote port that you're connected to, the local dot address of your host, the local port that your host is using and the local name of your host system, so it's a mechanism for finding out a lot of things about the local host. The receive event is called by the library when data is available to the application and you'll see there's a pointer to the data and the length because there could be imbedded nulls in the data for many protocols.

M: [inaudible] the application pro-actively goes out and says I want to read x number of bytes [inaudible]?

Michael Baldwin: That's a good question, we've thought of everything. Once a connection or even before a connection is established, we can call receive to set the max spike count and what that can act as is a throttling mechanism on the communications to the host and a good application of that, for example, is on our VT-220 emulator where there's a pause key. Ever been in an emulator and you [transfer] a 1 meg file by accident? Well, when we had the buffer opened up so that we would accept as much data as was possible on the machine, then when you hit the pause key a couple thousand bytes later it would stop, but when we set the max spike count to 80 in our emulator and then we hit the pause key and it sets the max spike count to zero, and all that does is it tells the library not to read any more.

M: The data's still just sitting there in the buffer waiting to [inaudible].

Michael Baldwin: That's right, and it provides back pressure, good lead in, this guy's great, it provides back pressure in the connection so that when you do a receive zero, stop receiving, your buffer fills up, so those IP packets are still coming from the host and you don't acknowledge them, they're dropped packets, then the host re-transmits later and so it provides back pressure. So what that does is, your buffers fill up and then the host times out so that starts relieving traffic on the routers and everything in between you and the host and it's called back pressure. It's relevant when you're running a 386 against a high powered HP, for example, in doing an FTP download. Your PC just can't go that fast and the fact that it's not handling the data as much as quickly as the HP, or whatever, is pumping it out, means that packets are dropped and not acknowledged, finally they're processed and then they're acknowledged and then they're repeated.

M: [inaudible].

Michael Baldwin: You get a blocking. It's called the send function on both the UNIX side and the PC side and if your local data buffers are full meaning that the recipient has not acknowledged the receipt of your local data, your buffers become full and then basically comes back to your application and will not accept any more data, so it comes up to the application level. That's a very good point for anybody ...

M: [inaudible] when you get that back pressure you're sending stuff and it starts to fail, you're going to have to put your own time-out back [inaudible] and try it again, right?

Michael Baldwin: That's true if you're developing yourself. If you're using our communication libraries ...

M: [inaudible].

Michael Baldwin: Thank you very much, yeah, we have it built in. It's called a send event, so what happens is send a pointer to the data, the byte count, usually [inaudible] is false and a D-word data tag. Let's say the byte count is 20,000 bytes, well, we know that that's bigger than the WinSock buffers, there's nothing that big. So what happens is, internal to our library, we send as much as possible to fill up the WinSock buffers and let's say that there's 18K left, we

make an internal buffer and fill it with the 18K of data as local copy, and then as it's spooled out over the WinSock, your application gets a send event with that data tag.

This data tag right here is the same as this data tag right here, so, for example, let's say you send out five buffers at 20K each, 1, 2, 3, 4, 5, and the data tag is 1, 2, 3, 4, and 5, your send event will be called and after a second or two with a 1, after a second or two with a 2, etc., until all the data is exhausted. So it's a verification and it's used for flow control. What flow control means is this back pressure thing, how are you going to manage the flow of data off your hard drive over the network.

M: [inaudible].

Michael Baldwin: That's right, right.

M: [inaudible].

Michael Baldwin: That's correct. It's optimization to try to send it out as quickly as possible.

A listen event is verification that a demon has been opened on a port and is listening so you get the local dot address of the port you are listening on and your name. Accept event is called when a remote process connects to your listener, so you get that accept event. An exception event is an exception mechanism. Basically it provides some error code information and description of something of an exception.

M: [inaudible].

Michael Baldwin: We have a number of protocols and perhaps we could talk about it later and I'll show them to you.

The connect function now, the public functions here are the functions your class will call. For example, to request a connection of the things of relevance are the flags, which allows you specified debugging or showing of information. The real relevant ones are remote host, remote port, your local dot address and your local port if you are a multi-homed host you may want to specify a local dot address, and if you cared or if it was required by the protocol, you would specify a local port.

For example, the FTP protocol specifies that the data port opened on the server should be 20 or 21, if memory serves me correct it's one of those two. If you're ready to accept a connection so in response to an accept event, you accept the connection, that's the second right there. To send data, we reviewed earlier, in order to listen for our remote connections there is a time-out parameter that a gentleman asked about previously and then we have a close where we can specify no delay or not which simply means whether an abort or a graceful.

M: [inaudible].

Michael Baldwin: Yes, it has to do with linger. Linger is a socket option on whether or not the close should be a graceful close that is acknowledged by the other end or a non-graceful close which just means you go away.

M: [inaudible].

Michael Baldwin: No. On the send, that information is not made available via the WinSock interface so that your application or our library doesn't have any control over the time-out.

M: [inaudible].

Michael Baldwin: And on the receive, if there's data there you're simply notified. You're notified if the max byte count is 1 or greater.

M: [inaudible].

Michael Baldwin: On the receive side you know the number...

M: [inaudible].

Michael Baldwin: The actual on the receive event, that's [inaudible] to the data and that's the byte count of the data, so that's what you actually just received.

M: [inaudible].

Michael Baldwin: Well typically you do not call receive. That receive is only for setting the max byte count because the way it works is, [as] the remote host sends you data within the class we know it, we make a local buffer and we pass down the information to your class.

M: [inaudible].

Michael Baldwin: Yes we do and if I had a UNIX host I could show you a very nice demonstration of how we connect up to an echo server and with a very small buffer size of 1 and as we increase the buffer size it just comes. It echoes it back very quickly.

Does anybody want to take a break? Okay, let's break at this point and we'll resume in, say, 10 minutes.

[Break]

Michael Baldwin: Welcome back from the break. I had one comment from the session who asked for some more examples. Would it help the group if I came up with some quick application areas for these classes? I had not originally intended that to be part of the presentation. Yes? No? Well, as we go along...

M: [inaudible].

Michael Baldwin: You want a link between an upper layer protocol and the TCP class? Okay.

M: [inaudible].

Michael Baldwin: Okay. Well, let me address the event handling. Is he coming back?

M: Yes.

Michael Baldwin: I'll hold off on that then. Let's talk about a driver class here that provides an added layer of software manipulation to the TCP class that we just described and this is called Telnet and most everyone here has probably used Telnet to log into a remote host.

The unique thing about Telnet is that the commands are embedded in the data stream so there is a functionality there that we have to do something with. We have to write some software that handles that functionality of imbedded commands in the data stream. The data has to be parsed and searched for sequences that must be responded to. And we make the note here most hosts will just halt communications if you do not respond to an event like do this option or don't this other option. It's called option negotiation. So if you thought of the TCP class here on the left, to the left of the raw data, that is throwing in raw data into the parser and you are to think of that as your Telnet class as the parser, then your Telnet class looks at that receive event that we talked about in the previous slide and searches for what is called IAC strings. When it sees an IAC string, it calls a command event with that IAC string or some representation of that string that one defines, and if it's data, then the data event is called and then you process the data. So there's a forking, if you want to think of it that way.

Telnet is an upper layer protocol that uses port 23 as a default connection, so after you create a Telnet connection just like you do a TCP connection, as a matter of fact the Power TCP class provides the connect member function that is actually called from the class that's derived from Telnet. Then the application needs to search for these control sequences and to respond to them, so that's the only trick to using Telnet — responding to these IAC sequences.

Now usually one would simply display the data on a viewer or in an edit box and our VT-220 special edit box, for example, actually interprets VT-220 escape codes and then performs that emulation right in the edit box and then when a user types in the edit box, typically that data is sent over the Telnet connection back to the host. Then the connection is closed when complete. So if one were to look at the typical Telnet session, we see that bullet one, create the connection you simply do a TCP connection on port 23 which is accomplished through the Power TCP class which is one class up. Then in the Telnet session we search for the control sequences and that searching is accomplished in the Telnet class because it's special, so this is specialization and then what is done to display data or send ASCII data is simply functionality of your application and then the close is accomplished just like a TCP close.

The class header definition C Power Telnet is derived from the Power Telnet class [and] provides private functions that are used for internal utility purposes. It searches for a string, for example. There is a command buffer that is specified and I'll point you at the receive event. Look where the receive event is called. The receive event is right here. On the receive event right there you see our derived class is intercepting that data and all the data comes in the receive event. Then what it does, depending on what's in the data there, it will either generate a Telnet receive event for your application in a derived class or a command event and that's the added functionality that it provides.

Now, what about the connect event, you may ask. Remember in the Power TCP class we had a connect event, well, this is in addition to that, so that exception event, the connect event and those other things are provided down in your class as well as this Telnet receive event and the command event. Then for added value the library by calling send command, you say what command you want to send, what option you want to utilize, sub-options string, and etc. So this is an example for using C++ class structure to add specialization and value as you derive classes. Now, in a previous slide I believe I showed a user class that was derived from this, any user class derived from the C edit box, so what you do when you do that is you marry communications to the visualization and make things very tight and very convenient.

I'm going to move on to FTP now. First of all for those not familiar with the protocol, file transfer protocol is a way to move files across the network and it does provide authentication support by a user and password mechanism. Most file manager features that you see like directory support, change of default directory, give a listing of the directories implemented. It supports both binary and ASCII transfers. A binary transfer is an exact image of

what was sent and an ASCII transfer is useful when some type of data is passed over the network where you want to know where the end of line is and the standard for knowing where end of line is over a network is a carriage return line feed for Telnet. So, if your UNIX host just has a carriage return end of line that's no problem. It changes it to a carriage return line feed over the network and then in Windows land we use a carriage return line feed to indicate end of line so that's why when you do an ASCII transfer of an ASCII file, the file is bigger when you get it because it's got the extra line feed on the end of every line. The reason that you really have to specify it is because if you have a binary file and it thinks it's sending it in ASCII, you can have unwanted data in it.

The benefits of FTP are that it's ubiquitous, the lowest common denominator in many cases of moving data across the network. The only competition it has in that category is trivial file transfer protocol or TFTP which is a UDP-based protocol that is implemented on many routers so you can typically TFTP to and from a router even when you cannot FTP to or from a router.

The drawback of FTP is it is inefficient for numerous files because practically every one requires a data connection for every single file and then you have a lot of overhead for generating all these data connections.

Now having said what FTP is, this is how it operates.

[Tape change]

Michael Baldwin: ...information over the control connections, so you log in. Create [a] TCP listening demon or server, so you tell the TCP object to listen. Is there a question?

So, right now at this point, we have a tele-control connection, now we have a listening demon listing at a port. Now we pass the address and the port of the demon for, there's a reason you have to do that, without having to get too technical, this is technical enough, right? When you pass the instruction for the file transfer, or the list, or he wants it more technical, pass instruction for the file transfer, like retrieve, RETV, whatever the file name that you want, and when that happens, then the host connects to your listening port as soon as it's connected and starts sending the data. And since you have orchestrated all of this from your client, you know what's going on.

So then you accept the connection, the host transfers the file data, or you transfer the file data, or the host sends you the listing data, the listing data that you requested, and you close the data connection, or the host does, when you're complete, and then you close the control connection and you're finished. And you can see all the messaging going on if you use a program like WS FTP, by John [Genove] on the PC side, it's kind of out in the public domain, and he makes all his mechanisms in the handshaking visible so you can see what they look like.

Now, this is on our entire FTP class, because there's like 30 functions underneath that, we're sending every possible FTP command, defined by the RFC. But this part up here is enough to illustrate the functionality, and when we have time, we'll go into the non-exposed part, for anyone who is interested in seeing that, to illustrate what goes on behind the scenes.

But, the reason this is a very good example of communication libraries, is because it abstracts, as highly as possible, something that is very much program-oriented and state-oriented, because when [do] an FTP, as we saw on the previous slide, log in, user name, send it to image type, listen up, send it to port number, retrieve the file, report the file.

So, as you go in to define your own communications library, it's called extraction, you need to extract to a very high level, as high level as you possibility can. The functionality of the protocol, so that when your user, perhaps you're an IS shop, maybe you're part of a... a very good example, you're working on a fairly big project, maybe you have four programmers and

then one programmer is designated to do the communications interface, and what he does, he extracts to a very high level, to provide an interface to the users of the communication stream and specializes it, to what they're trying to accomplish.

A customer protocol is sometimes used in the communications business, so that when this string of digits is received, the information is sent out. For an example if you wanted to make data base information available in a proprietary way, to people just in your company, you would want to hard code in some port number that you want to connect to and then you may want to extract out the type of information that you want into, like, ten types and then you just provide that interface to your users and they choose one of the ten types and they're in charge of doing the very nice [inaudible] machine interface and all those very nice things. But in your communications library, that's where the business gets done, and you're able to implement your proprietary protocol, just as these people here, back 10 or 20 years ago, defined upper layer protocols that caught on and became standards.

This is an example of a reference that's encapsulated, this gentlemen over here asked if he could see an example of how that's used. And the reason that it's encapsulated is because, up in the FTP control class, the FTP control class knows about the list, knows about the data connection, knows about the Telnet connection. So, the fact that we made him a reference, or we could have made him a pointer, by reference [inaudible], or because the reference always has to refer to an object. By providing that technique, we don't have to include a header file for the CFUP control class. So down here in this class here, that we've defined called Power FTP, within the library, we call control dot what ever the function is that needs to be accomplished.

M: So, does that mean that this class doesn't actually [inaudible] from the TCP class?

Michael Baldwin: That's right. This is an example of a class that uses an encapsulation technique with a control to keep private, but the description of the parent class...

M: [inaudible] it's already called back [inaudible]. You're getting the call..

Michael Baldwin: Exactly, so the mechanism here is when one of the, like the first procedure to be called is log-in. And [in a] log-in you say the name of the host that you want to connect to, and their user name and pass word, etc.

In our library, we get that. We say, oh, control.login, and provide the same parameters. So it's like a proxy if you will, it's between the user and the guts of it and the reason for doing that is so that your private HPP files don't have to [be] propagated everywhere.

M: So, [inaudible] but if you have the [inaudible] in the control class is implementing your [inaudible]. And then it has to somehow forward those messages back to your [inaudible], ITP class.

Michael Baldwin: Right

M: Does it have an [inaudible] to that, does it also have reference, also back to here?

Michael Baldwin: Yes it has to, and you knew the answer to that before you asked me.

M: I wasn't sure. I'm not a really big [inaudible].

Michael Baldwin: The connect event here, what happens is, and notice it's a virtual function, it looks just like our TCP connect event, but what actually occurred is up in that control class, the connect event was called, because it was derived from a Telnet class. And then all it does, it says, it turns right around and says, whatever it's internal name is for this class here, FTP.connect event, remote.address and so, that ties it together. Some people might use the term glue, you know, that reference to the control object, is to glue to this class here.

I understand ADA, that program language allows one to hide things by making them private and not having to replicate the HPP files all over the place.

M: [inaudible] The control [inaudible] transfers the events to [inaudible]. So it has to know you.

Michael Baldwin: That's right, and this goes back to what your previous point, that you can have these two objects talking to each other. This is an example of the reason for doing it that way.

M: Sure, but look at the [inaudible]. The control has to know the c [inaudible]. The c power is not derived from anything, so the [inaudible] base class, for which it knows [inaudible] events, how can it [inaudible] in it's constructive ... how can the control know the c power of the object.

Michael Baldwin: Okay. If you'll when the constructor of c power FTP is fired off, in it's, and I'll show this in the code a little bit later, after this session. But in the constructor for this class, it actually does a new and a C FTP control and provides a pointer to itself, this...

M: So the C P controls, expects in its constructor, the C Power [inaudible]?

Michael Baldwin: Yes, point to it.

M: [inaudible]

Michael Baldwin: So, in the constructor, to restate that, in the constructor of C FTP control, it's given two parameters, one the H instance, and right down here, that stands for internal reasons, and the other is a pointer to C Power FTP instance, which is called this of course. And then it saves that pointer, so there's a two way mechanism, so each knows about the other and it happens right in the constructor.

M: [inaudible] how the C FTP controls line [inaudible]

Michael Baldwin: Okay. If I was to do the alternative, which was, if I would derive C Power FTP from C Power Telnet, which is derived from C Power TCP, all of the data members in the C Telnet, in the C TCP and the C Power FTP, excuse me in the C FTP control, all those data memories would be exposed to the user. Because when a new C Power FTP happens, the object needs to know how big it is. When a C++ object is constructed, it needs to know the size of all it's data members and all the data members of everything it's derived from, so it knows how much space to allocate for itself. And the only way it can know that information, is if all the HPP objects it's derived from are included.

If you look at MFC, it's a very good example, and now you know why all those header files are in there.

M: [inaudible]

Michael Baldwin: This eliminates it, because the construct C FTP control, @, that means it's a reference, which means that basically it's a pointer, and the compiler knows that a pointer is only four bites long.

M: [inaudible]

Michael Baldwin: So the compiler can, when you drive your class from this and create a new, the compiler knows, okay, I've got to allocate four bites for control and whatever the data members are in the drive class and that's it at compile time. And then, at run time you say, new, see user FTP, it does a new on itself, so it knows how big it is, and then when it's the constructor of, and in the constructor of C Power FTP, we do a new C FTP control and dynamically allocate a second piece that's not part of the same object.

M: [inaudible], basically creating a C FTP control file [inaudible] within the constructor of C power FTP, you're creating an instance of C FTP control.

Michael Baldwin: That's right, and it's those dynamically created, it's a second object.

M: [inaudible]

Michael Baldwin: On the what?

M: [inaudible]

Michael Baldwin: Yes, destructors are almost, are always virtual. You don't have to state it.

M: [inaudible]

Michael Baldwin: I believe it's always, well...

M: [inaudible]

Michael Baldwin: I'll look into it, we haven't done it that way.

M: [inaudible]

Michael Baldwin: Well perhaps we can prove or disprove that after the session. Yes sir.

M: So basically, [inaudible]

Michael Baldwin: It's actually the client, it doesn't implement server functionality. And all the events, they are live events, whose upper layer protocol is a log event, that's used to inform the application of, actually data of, that was sent out to the host, for informational purposes. A receive event is used for spooling data over data connection directly to the application and for listing data.

A transfer event, we have an action where auto spool is an action, so that the library will take care of sending and retrieving data from with the library so that you don't have to do it. And the transfer event is very interesting, because like on some kind of a block boundary,

and every read boundary or write boundary in or out of the file, a transfer event is called, because sometimes...whenever see you're doing something and a little bar goes across, you know like a red bar or something, how much [of] the download occurred. You want to give some kind of user, feed back to the user when you're spooling a file of how it's going.

With [ply] event, FTP is full of these; particularly [when] you send it one thing and then you expect back something else. And so our way to handle that is with this FTP status indicator, that says, if it was expected, a part of the protocol was returned, so on the user side all they do is check for a success indication, instead of having check all the different numbers that could be coming back from the FTP server.

M: [inaudible]

Michael Baldwin: Yes, that was, like, if the FTP command was retrieve a file, that's just a little help back to the event, saying that you're retrieving a file remember, and that's the local file spec that you had specific. Or if was sending a file, it might have been store or store unique, or append.

M: [inaudible]

Michael Baldwin: Yes, and it's something to keep in mind when you make a library, especially a communications library, you can save state information within it, because you really have to, because many of these protocols are state machines.

So you save the state and then you simply volunteer the state information to the user whenever it's relevant. We have taken that approach versus another approach, where you can force your user to ask all the time for things, more or less on a polling-type nature. We have standardized on this model where the public methods are provided for you to call and none of the public members give you a way to get information, except for the state. And then with the events, this is where you volunteer information to your user and it greatly simplifies the life of the individual doing the coding on the implication side, because now he doesn't have to ever think about checking on status or states, as much as he simply starts things in motion and then is notified whenever something happens.

A lot of our customers are Visual Basic customers, a little different class of programmer. But, they really love the idea of this synchronous operation. I mean, I don't know how many guys do a log in and then he'll do events forever, waiting for something to happen, just so he can send a file, and then he'll do events again, just so he can close, just so he can have everything in a line right there. With Visual Basic, you search [for an event] driven mechanism with these events, I mean built right into the environment and all you have to do in Visual Basic, is all you have to do right here.

When something happens, what do you do? It's a terrific, it's a very releasing type of mechanism, because some of us going back more than 10 years, we're used to the idea of having an executive and you're writing the executive and making sure that everything is done correctly and on time and everything, and it makes the control mechanism, makes everything very complicated. Well, if you just throw up your hands and become entirely event driven and distribute like this, you have no executive, you are simply notified. And it simplifies debugging, and the control of the application, I mean 10 times.

So it's event driven nature is wonderful in C++, it's a little messier in C, because you've got call back functions, it's great in Visual Basic, and now in VB4 we have the OCX's. And we've even got a tool kit for Delphi, and the call backs are supported there.

So, a little of advice for anybody going out there doing communications, always do it asynchronous, always do it event-driven, never force a user to poll or call a function more than once to check on anything.

M: [inaudible]

Michael Baldwin: If you want to, under NT with our VT-220 emulator, we're starting a thread for every VT-220 session, within our [MDI parent] and each one of the windows is [MDI child,] and each one on it's own thread, so we're going to have the communications and everything on it's own unique thread. Typically you don't have to do that.

M: [inaudible] thread to handle the data transfer, [inaudible] the file transfer to go off and actually start another one [inaudible]

Michael Baldwin: It's possible that some FTP servers may allow that. The FTP servers that I test against break, if you try to do more than one file transfer at a time.

M: Do you have another class that we can see here that would substantiate [inaudible] transfer, that inherits from a TCP or TCP plus?

Michael Baldwin: For a data transfer?

M: Yes.

Michael Baldwin: Yes we do. We have, as I've shown here, it's up there in that control, right after the, and if you want to stay around afterwards, we'll show you the code that implements it, accepts connections and all that stuff.

M: [inaudible]

Michael Baldwin: What's the question?

M: [inaudible]

Michael Baldwin: The TCP class can be used with [both] passive connections and active connections, so either servers are [clients].

M: [inaudible]

Michael Baldwin: Well, one of the things that we have to do with the commercial library is provide, kind of like base lines. This one provides this functionally, this one does this, this one does this. Now, it's up to the user to specialize it, to do something just for his needs. So for example, in your application, you may be, want to write a demon and derive it from our TCP class and have him be a listener and have him actually hold a list of connected sessions with each one, or perhaps a different derive class providing particular functionally. I've got a guy back at my office right now, he's half way through writing a Telnet demon for Windows NT.

So we've got the one class, that's the listener, and then we have this other class, and he's a console window. And the console window has properties of a window and has properties of a connection. Then when the listener accepts a connection, he assigns the new

connection to this guy. So he says, new console window, accept new session, he's off and running. So, we build these classes, we specialize these classes to a job you want to have done and then substantiate them on the fly. Dynamic allocation is a great thing that C++ gives, as I mentioned as a strength of a language. Yes sir?

M: [inaudible] Do you have any kind of way of getting, say, one [inaudible] and one application with multiplex multiple connections off of that, or say for instance there's only four ports available in that machine, but I want another 20 users, I want multiplex [inaudible] users I need for those ports, [inaudible]. Do you have any classes that do anything like that.

Michael Baldwin: Well I think you brought up a couple subjects, one is how to multiplex under TCP. Multiplexing is typically done by the system, we take advantage of the system, because we can open up an listener for example, if we accept one connection, it's connection-oriented remember, so as people connect in, we have to have a unique socket for each connection. So, what that does, well we just multiplex, we had to, we didn't have any choice. Because there is no way that people can hook up to the same process, you can't have a three way conversation. Because we're a TCP, we are point to point, so the multiplexing occurs because of the connection nature.

M: [inaudible]

Michael Baldwin: Now the select call, the select system you're referring to, is a mechanism for finding out which port has data to read from, for example. And we handle that totally event driven and keyed off the WinSock function, because the WinSock function will tell us when there's data to be read. So we surface the data then down to the user class, using the class library.

So, if I were to draw a pyramid here, to use the same imagery, if WinSock was at the top of my pyramid and these classes were built all the way down to the user level right here, and each object interfaces to it's own window. So we have six connections. When data comes into one of those connections, the event is triggered and the data is propagated right down and shows up right here as a receive event.

M: All it says is, I accept this action

Michael Baldwin: That's right, you have to give back the other call. It's a very good question, because it shows the object-oriented nature of this object. A single object can only do one thing. A single object can make a connection and converse or a single object can listen for incoming connections, and that's the only thing that a single object can do. So when the connection comes in at the listener, he has to do: new see new, what ever the new class is. Dynamically allocate it and then assign it a connection and we have a mechanism for doing it, just assigning it.

M: [inaudible] somehow transfer the information, some kind of handle over that new class [inaudible]?

Michael Baldwin: Typically what we would do is, a listener accepts the connection, you would dynamically allocate a new session of a particular class, we have an example, and then assign it the connection and then once that is done, the protocol goes back and forth between those two objects. So the new one you instantiated, and then perhaps a second later, another request

for a connection comes in, you do and maybe you keep track of these new objects on a list, so that there's a mechanism for keeping track of this bag with all these sessions going on. And then one side closes and deletes itself. This could be quite elegant, where whenever the connection closes, it just deletes it's own object. It's really very interesting.

You have these objects that are dynamically created and they delete themselves when they're done. It goes back to the control issue. If you can ever [have an] object do it to itself, like delete itself when it's done, or what ever, then you've encapsulated functionality in your class.

I'm sure everyone's familiar with dangling pointers and everything, and you've got, it goes back to the executive idea...

M: [inaudible]

Michael Baldwin: Yes, in FTP for example, when the data connection is closed by the other host, or we have no more data to send over the data connection. We close the connection and then we have a confirmation of a close in our receive event. If a null has passed through the receive event, it means the socket is closed. Right there we do a delete this.

M: [inaudible]

Michael Baldwin: To delete this...

M: [inaudible]

Michael Baldwin: The alternative is worse, how do you know when to delete it. If you can't... if the object can't do it itself, it means that you have to have another object delete it. So you have to have notification to the other object...

M: I'm not arguing about the design, just that you triggered some event [inaudible].

Michael Baldwin: Okay, well, thank you, I haven't run across a problem with it. And the reason we can do it, is because notification comes from the system from a WinSock event, so that when we delete this and we unravel everything we are not returning to some object that referenced us.

M: [inaudible] and it wants to eventually close it for some reason, but then [inaudible] has already completed itself [inaudible]

Michael Baldwin: A good question. The way we handle that in the FTP class, is that [in] the FTP control class, there's a pointer to the data. There's a pointer to the data object, and when the data object deletes itself, it nulls out the pointer in the control, so the control always knows if that data object is there.

M: So, if you delete a disk, and it was reallocated somewhere else, some other thread, it can no longer [inaudible].

Michael Baldwin: If what was reallocated?

M: Well that area of memory, [inaudible] reallocated by another object, [inaudible] no longer be null.

Michael Baldwin: Oh, it's a pointer in the control.

M: Because that was the lead, right?

Michael Baldwin: The control is always there and within the control he's got a pointer to the data connection. And what happens is, when the data connection is created in it's constructor, it updates the control object with the pointer to itself. So that the control object knows when it's in existence, and when the data transfer all occurs, and then it delete itself...

M: It deletes itself, it doesn't delete the control?

Michael Baldwin: No, because the way FTP works, you always have the control object there and then these data objects come and go as you transfer files.

M: So there's always one out there [inaudible]?

Michael Baldwin: Always there's a control, because that's the one that logged in, remember, you had to log in with a user name and password. It may be used, may have used the term session. You have an FTP session while you're logged in, and while you're logged in, you can get listings and get files, and send files.

M: How does that [inaudible].

Michael Baldwin: Well, when you call the close function...

M: Okay, so eventually you do have to [inaudible].

Michael Baldwin: Or your application you would just delete your object.

M: [inaudible] some kind of object, kind of an accept [inaudible] and create other objects [inaudible] independent sessions. I understand that these sessions decide that they want to go away [inaudible], or what ever, and they [inaudible] delete themselves and go away. When we have a case, we have a server and we have ten connections, we still [inaudible] and we have to turn the server machine off to do backup.

What we really need is for somebody to go and say, tell each of the objects, the session objects to kind of go away and then we can finally go and close the accept objects [inaudible]. In other words, this is a kind of a shut down force, in other words, don't let the two objects that are [inaudible] decide, have the server have many... shut them all down kind of thing.

Michael Baldwin: At any point, the control connection can be shut down, or it can be more graceful and just not accept any more traffic and try to just finish up what it's doing. But in either event, the way we handle it, is if the control connection is shut down, we delete the listener, if it's listening, and we delete the data object if it's in existence.

M: Do you have multi-poll data objects?

Michael Baldwin: Well, the way FTP works, you can only have one data object at a time.

M: Because if you had some kind of larger server, [inaudible], you're talking about some kind of link list, or you would have to manage your own objects to know in terms of sessions what's out there, and then run through a list. Or, if somehow by shutting down the accept [inaudible] properly, does the other guys all go away.

Michael Baldwin: Well it would be safe programming practice on your part as the designer of such an application, that if you had a control connection, or some way to find out from a host, then a shut down was in progress, that it would clear up, appropriately. This is, you're not talking about a standard protocol, but the beauty of these tools, actually, that you can implement whatever you want.

M: I'm just trying to figure out, what implements [inaudible], multi [inaudible] connections, multi... we have some instances where we like to do that kind of thing. One server with a lot of clients connected and someone wants to turn the machine off to do maintenance, so you have to somehow systematically go through and notify everyone [inaudible].

Michael Baldwin: So the way you would do that...say you're port 2000 implements your proprietary server, that sends information. And then when you're implementing your protocol, some kind of signal, like star star star, that when ever it's received, notifies the client that there's five minutes to go. Or you could simply close the client connection, which would be the signal back to the client to release the resources.

M: If you had local clients [inaudible] you had multiple object substantiator, right?

Michael Baldwin: Yes, a list is typically the way you would keep track of it and ... Maybe, I could give you an example, of just that, we'll look at some [inaudible] here. (If you'll excuse me I'll sit down so I can see a little bit better.)

Here we have a tool kit shown that, we'll just run through the applications so you can see what it does, it's called an echo server. Now when I started this 16-day application, this is a C++ app, what we have shown here is an MDI parent window and we adapted the MDI parent, and did a double inheritance and a listing, that is actually, so we derived this class both an MDI parent and then a TCP object and sent listen and port 7. So, we see here [the] server is listening on port 7.

I'm going to run through a little demonstration routine and I typically use this for demos because it illustrates so much functionality. Before I do anything, I'll explain what it does.

An echo server is an application that accepts a connection and then repeats back whatever it receives, so it's very simple in functionality. But in order to construct such a beast, it's quite complicated, because you have to dynamically allocate resources to handle all the structures and information and the communications and all that stuff.

But how a communications library can make that easier is that we actually have them in an array, one, two, three, four, five of clients. They're done [inaudible] when we dynamically allocated this forum and this is [inaudible] back to it's creator, it's new and assigned to an array of link five, of [planners to] five communication matrix.

When I press test, what it will do, [is] it will tell each one to connect to it's own IP address so we're going to do a loop back over the, through the network layer, but we're going to use an IP address that is S on port seven. And then this listener here, there's a user class drive from the listener, whenever he gets an accept event, he will do a new MDI child window.

And an MDI child window is actually derived from two classes, the MDI child and also a Power TCP control. And then after it does a new, it says, accept and accepts a pointer to the listener and gets assigned the communications.

Then the total responsibility [of the] object is simply whatever it receives [and] sends it out. That's the entire functionality of that object. And the entire functionality of this thing where I press test, dual connection and then when I get a connect event, any of these are all the same class. So in this class if I get a connect event, I send this information. And then I try to send again.

So this happens very fast in this environment, [inaudible] you guys want to see it later, it's the new Gateway 2000 [inaudible] with a CD-ROM. It's a 90 megabyte, 90 megahertz Pentium, and just screams. But when I do this in Visual Basic on my 486, you can actually watch the things happen.

But, we have these file connections, and they are all on MDI child windows and we put up a new screen here what came in and then here on the other side [inaudible]. So, we'll showing the same thing each time.

[Tape change]

M: [inaudible]

Michael Baldwin: Yes, we have, actually, on this platform I I circuits allocated, one listening on port 7, these five objects over here, caused these five objects to be substantiated. And it's not very much code in Visual Basic, the actual network incurred here is about, or even in this environment is about ten different function calls or less. All the work is done just constructing the super plus objects that do behavior. When I press "test" here, it will close them all down and make five more... This is the first time I tested this on this platform, I'm surprised that it's working, I just got the PC last week.

Just to prove a point here, if I shut down this one, the other side is notified and [inaudible] in the window just as a custom feature.

M: [inaudible]

Michael Baldwin: ... but then again all the others worked, but that guy is no longer there. You cancel and it closes everything down. So that's our Echo Server sample.

We may have the network back up, so let's see ifIf we're up, this would really be great, oh, good.

Now this is my office back [home]. On my VT-220 emulator here, so I'll just cat et.test. That was my HP.

Here is my VT-220 emulator that shows all the characters and special thing. Okay, how would you guys like to see this in debug mode?

M: [inaudible]

Michael Baldwin: Okay, it's \$69.00. Go to our Web site and you can download a free demo. Okay, I linked all of my development libraries right at this point, so we can choose what we'd like to look at. But I think an interesting place to look would be [inaudible] CCP, this is, and you're all going to have to help me here. What would you like to see here? There's a huge number of things that we could show.

Remember before we talked, and probably very instructive, because it shows how a layer can be used to a particular functionality. So, this is our C Power TCP [inaudible]. We're not hiding anything here, it's all in there and the first thing that happens is, we see, we get data from the host, because we provide the body for this and say, if no buffer, meaning it's the end of communications, we do a Telnet event.

Remember that was the one way that we tell the drive class that there's data. Well, we do a wild count here and this is where we search for IACT, that we talked about before, so we go in here and do a code here to search for things, and if there's no IACT, tell it we see data, receiving that, there's a pointer to the data in the cat, there's I present, report the data and then strip out the IACT. So we put the data right there and then we put the IACT here in the command buffer and then we continue to process.

M: [inaudible]

Michael Baldwin: It always is and the reason that our [inaudible] library when everybody else does, is because we put it in this buffer off to the side. So that if we get a receive event, that is like breaks in our command in the middle, we've got this buffer off to the side that handles it. It's very robust.

M: [inaudible]

Michael Baldwin: Absolutely, this is it right here, check for a complete command, so we stuffed it in the command buffer and then we checked.

This is where we check for [inaudible] command and we do some searching and stuff. Then if it's a valid sequence, we call command event. So we make this, the implementation of this, we enforce the protocol and if it doesn't comply with the protocol standard, then we call an exception event, which is like what we did up here. [inaudible] it's a command event, if this condition's true, then we throw an exception there.

So all this code here is really not that much. But we've totally eliminated any of the other mechanisms that we had to worry about in the TCP class from this class. We just assume that there is a reliable string coming to us. And this is our second biggest revenue generator behind FTP, but it's cheaper, we actually sell more of this library than another, because it's so popular and used in so many places.

Let's find the end user [inaudible] application here. There's our [inaudible] size VT-220 sample and I chose to call this our Telnet Client, and you see right here we derived it from our Power Telnet and our VT-220 library, so multiple inheritance. And then these are the events that we have to worry about, key press event actually comes from VT-220. Connect event, receive event, command event and exception event come from the Telnet. There's a couple of private things there and that's the entire class.

If we were to look here at some of the interesting data, like command event, want to take it for a spin guys, did I hear a sure? I think I compiled this already in debug mode.

We'll capture command event when it comes in, live over the Internet. It's great these guys get me connected. Okay, here we go.

We've got our first command event coming in from my Telnet host in New York. Okay, we've got a 253 for the command, and the option is a 36 and there's no sub option, so we'll just step through here and see how the code handles it. So it's a do command and it's not a Telnet option, window size or terminal size. So we say we won't, we say, not, it won't.

Now, I don't know if we'll get another one, we did. Sometimes when you interrupt the real time communications, it doesn't continue. But this time, we get a do command, and it's one

of those options. 24, I'm not sure which one it is, might be terminal type, but we say, I will, at any rate, and then it comes down again, sub command, it was terminal type. So if it's terminal type, we want to be at VT-220 and the way we do that is you send a no VT-220, and this is a programming error, then should be another no on the end, but it probably works, I'll have to tell Paul.

Then we do another one here, and this was probably echo, that's a real popular one, you see a lot of.

Let's do something fun, I'll look at, [inaudible], so we move down to our power tone at receiving it, and it was right to here, we're going to go all the way down to my library, so that we have a library receiving it. And we'll call it Power TCP receiving that. You're seeing all my secret stuff now.

This is our receive function, well let's see how many we received, we may be able to see that, 58. That was 58 bites, [inaudible] received from the WinSock interface. [inaudible] this is way down the WinSock class. You'll see we had an event triggering our receive and handling.

So all this stuff works, and we'll turn that off. That was pretty effective, I wasn't sure if they were going to get the connections going for us here or not. So what do you guys want to see.

Officially we're done, but I'm going to hang around for anyone who wants to know more about this.

M: [inaudible]

Michael Baldwin: No sir, no, I don't booth downstairs, however, if you looked at our Web site, and I also have...

M: [inaudible]

Michael Baldwin: I do have some, a least a hand-out right here, if you'd like to take this. Give us a call, or access our Web site and you can see a lot of stuff there.

M: [inaudible]

Michael Baldwin: A windows socket is a standard that is specified and Microsoft complies with it, complies to that standard, and I can show you a real neat picture.

M: [inaudible]

Michael Baldwin: Does everybody plan to be here tomorrow, anybody not planning on being here tomorrow? I'll show you a quick picture. This is from a briefing I did to a bunch of people out at V Bits in Orlando last week, a Visual Basic program.

M: [inaudible]

Michael Baldwin: On the left we see a standard OS I model, which stands for Organization of Standards International, or something like that. Those are the seven standard layers of communications in writing software products. And the product that we're talking about, Libraries are pretty much session layer products. So if you develop your own library on the WinSock interface or whatever, it's a session layer product. In the TCP/IP mapping for upper layer protocols, the application writes for those three layers and then if you move, look over

here, our libraries really fall in the session area. So our code that you saw there, can be used by these different types of applications.

Now, I'm mixing my metaphors a little bit, but if you'll bear with me, I'll call this the WinSock interface, because that's a derail interface that defines how to access TCP and IP services from an application. And then the C++ class interface is right there and it just so happens that by deriving your user class, is the way you tie into...

M: [inaudible]

Michael Baldwin: Yes.

M: [inaudible] when you asked about connections, are these connections sources managed by the operating system or can you... do you have access to connections that are not open. For example can I write a software, another [inaudible] running on my server, and I want to write [inaudible] using your classes, [inaudible] any connections open [inaudible], any connections open and closing.

Michael Baldwin: No, you can't. Typically you can't keep an eye on that type of thing. The best you could do is intercept the WinSock DUL interface. Yes sir?

M: [inaudible]

Michael Baldwin: Yes, also. I lost my train of thought.

M: Okay I understand that, what you are saying is that the system [inaudible] that multiple access to these objects are objects that you created, only you keep track of those you created.

Michael Baldwin: They're pretty much tied to the task. So, if you were within that task and got the descriptor, then you could get information on it. There are some other mechanisms for getting information, I guess in NP. Typically, like get the number of packages being utilized. WinSock doesn't provide you... I think our UNIX, there's a way to get the status of all the open sockets of something, don't they have an application where the system manager can do that? Well, that would be like a, if that functionally is available, it's a proprietary interface to the operating system and not via WinSock.

M: Okay. The third question that I wanted to ask is [inaudible].

Michael Baldwin: Absolutely. Yes sir.

M: [inaudible] And I'm assuming that your power PC libraries, you [inaudible] all the different variances and nuisances [inaudible].

Michael Baldwin: That's a very good point, probably one of the biggest attributes from our customer's point-of-view, about our libraries that have been tested on over dozens of stacks and is working reliability. We do not test, explicitly test for a particular version or anything, but what has happened is over the course of time, we've located some stacks [that] behave a little bit differently. If an assumption that we make is not an assumption that they make, then it breaks. What we've done is we've just gone and fix it. We don't have to check, we've just become more defensive, more defensive coding, we've just added in where necessary.

M: [inaudible]

Michael Baldwin: At least for Microsoft NT, Windows 95 now, but you know they aren't perfect, I found a bug in Windows NT that drove me crazy, it took me a man day to fix it.

M: [inaudible]

Michael Baldwin: Yes, you see the standard is fixed, but the implementations are all different.

M: [inaudible]

Michael Baldwin: The question is what about WinSock II. WinSock II adds a couple of features, broad features. Number one, the protocol supports more types of protocols. And number two, actual features that kind of duplicate things that we already do. Under WinSock II you can give it a buffer, and say fill this buffer and tell me when you're done, very nice and event-driven. This is a very nice feature, that we kind, that's kind of like what we do for you, too. So it's a real good idea.

Now, where is it, it's two things, first it's the standard, so a body has to kind of make it the standard and then someone has to implement it, which is the second phase. And the standardization is not complete yet, and the good news is it's supposed to be backward-compatible with things that work today. So for example, we'll be obviously testing against the limitations to insure us through from our point of view.

Now, commercially, it could, if there's a commercial reason to do so, Telnet, our connect function may take another parameter called protocol.

M: [inaudible]

Michael Baldwin: Yes, just by changing a parameter on the socket call, what kind of socket do you want, an IPX socket.

M: [inaudible]

Michael Baldwin: The addressing will certainly change.

M: [inaudible]

Michael Baldwin: That's an interesting line, that's pretty detailed. Does anybody else have a general question, before I sit down and address that one?

I'm still getting used to the Windows 95. Let's go down to the basic clause, which is our [inaudible].

So, this window handler here called [inaudible] is a

M: [inaudible]

Michael Baldwin: Yes, in order to enable the event notification, we have to have a window, any kind of window, it could be a hidden window, it could be an MFC window, any kind of window...

M: [inaudible]

M: [inaudible]

Michael Baldwin: Yes, that's correct. It would be possible to show, but I'm not really sure why. So we have a socket procedure here, and notice that there's a member of our [inaudible] class, there is a [inaudible] end result, call back, socket pack. That means that it's a starter function, available to any member of the class and it's not associated with a particular instance. So there is no [inaudible] variable, that's important.

M: [inaudible]

Michael Baldwin: Good question, that's what you guys want to know. The socket is equal to get window, h wind zero. So in the NC create event, which happens very early on, we do a set win or something in the create [event]. And you probably all know where that is.

This is a creation of the window right here. So when we initialize the WinSock layer, we create a window, and when you're doing a C++ project, it's important to have two steps of construction. First is the C++ construction, where you don't really want to add too much additional overhead, because it's like really basic and the system takes care of it and returns a now, or a new if it doesn't work.

Then for any kind of object that requires additional resources, dynamic resources, like communication resources, you only have a second function, so that after the object is created, then you are stable and then you go ahead and respond more completely to any failures that occur.

So, after we create the object, we call initialize and it does nice things, like [inaudible] window class if appropriate. Then it creates the window, with H enhance and this. So, when the window is created, this is provided as parameter. Now, go back down to where we were.

The NC create call, the out parameter is a pointer and we reference the pointer, so we know, and that's for this. So, it gets set in the windows on, and then from every point it gets the window on for that window.

And then the socket object, close socket timer count, so everything is socket right or remote host.

M: [inaudible]

Michael Baldwin: That's a great question. Does an MFC have a C socket class? Yes they do. What does it do? Well it provides a thin layer to the WinSock functions. So it provides a wrapper, it's very thin, it's pretty much a one-to-one correspondence between a WinSock call and the call in the C socket class.

What does it add? I've had customers that, well one customer, he's a licensee of our FTP library but he's using the MFC class for the straight TCP connection, because it made sense to him, that's fine. The value-added that we provide, the testing and the maintenance and all that stuff, is important to different people for different reasons. For him, all he needed was FTP functionality, didn't want to take a couple of months to do it, so he licensed that. But for a straight string connection, he was satisfied with using the MFC class. It doesn't provide the level of things that we do for example, buffering upper data, that's still stuff that you have to worry about. Sequencing of things to do, still something that you have to worry about, but it's there. My customers are using it as well as our stuff at the same time.

It's not available to BVX yet, nor [inaudible], so people in environments that can use 32 bit OCX's, they can't use C socket. Probably half of my customers are in high level development, like Visual Basic and Delphi and about quarter of them are in C environment and about quarter are in C++ environment.

But the very high end users, they're in C++, or Delphi, the on-line people Delphi, they buy a 32 bit tool kit, there's some other vendors out here on the floor that you can buy tool kits from.

TUTORIALS

GETTING THE HANG OF UNIX



SPEAKER
Kevin Savetz
Computer Journalist

Kevin Savetz: I'm Ken Savetz. I am not an Internet guru. I mean, I'm an Internet guru, I'm not a UNIX guru. I am assistant administrator for North Coast Internet in California and I hope to explain to you guys some of the basics of getting the hang of UNIX.

The UNIX operating system has been around for a long time. It's the basis of a lot of what is on the Internet behind the snazzy graphics and the WorldWide Web. Most of the systems that are running on the Internet are actually UNIX systems. UNIX is basically a command-line interface which is not all that different from DOS, although it's certainly a lot more powerful in many ways. And a lot of the differences in how you use UNIX have to do with the fact that unlike using DOS or your Macintosh, UNIX is a multi-tasking, multi-user operating system and when you're on-line, there could be twenty other people or fifty other people using the same machine at the same time, so it shares the resources of the computer.

So, UNIX is very powerful, although a little bit more difficult to learn than something like a graphical operating system like Windows or Macintosh. I would like to get a quick idea of why you're all here so that hopefully I can skew this towards what you're interested in. I did this yesterday and about 90% of the people wanted to set up Web servers with UNIX and so I want to see if that's the case again.

M: I don't know [inaudible].

Kevin Savetz: Okay.

M: We're setting up the UNIX for our organization [inaudible].

Kevin Savetz: Okay.

W: I want also to set up a Web server [inaudible].

Kevin Savetz: Okay.

W: [inaudible]

Kevin Savetz: Background on UNIX? Okay.

M: [inaudible]

Kevin Savetz: Same thing? Anyone with anything novel or different?

M: I liked your book.

Kevin Savetz: Oh, thank you. Wow. Hey... Good.

So a lot of people setting up Web servers and people just wanting to get some background on it. First of all, up here is a URL. If you don't know what that is, you could leave.

We made a bibliography of Internet books, just four books, UNIX books. Four books that I happen to think are good introductions to UNIX.

In case you can't read my writing or you're listening to the audio tape which is available in the foyer, it's <http://www.northcoast.com/savetz/iwunixbib.html>. It's all lower case and if you can't read my writing you can ask me again later. I will certainly repeat it. Just four books that I happen to like that will get you going one step past this tutorial.

I think probably the easiest way to get started is actually to log into a UNIX system and to show you what it's like to log in and actually start moving around and creating some directories and some files and actually doing things. I'm using a Macintosh to log in, although you can use... I'm using Telnet to get in. You can use any conceivable machine on the Internet, or you might be actually sitting down at the console of the UNIX machine. It doesn't matter because it's all the same basic text interface no matter how you get in.

There are some graphical interfaces to UNIX such as X-Windows. I won't be getting into that. Basically that requires that usually you're at the console of the machine and most of us are just using text-based interfaces, so that's what we're gonna cover. Push the next button. We should get up on the screen there. I'm opening a connection... we can play with the lights maybe if you can't read that.

I am opening a connection to a UNIX machine at North Coast Internet in Eureka, California, although this could be a UNIX machine pretty much anywhere. I'm gonna see if I can bump up the size a little bit so I can read it a little bit better. When you connect to a UNIX machine, for instance by "Telnetting" there or sitting down at it, it says who it is.

This is a UNIX System V machine. There are a lot of different flavors or varieties of UNIX, we call them flavors. There's System V. There's BSD. There's Solaris'. This one happens to be running System V. Every different flavor of UNIX is a little bit different from every other and the commands might be slightly different; in one command "PS-EF" works to list everything that's going on the system and on the other type, it's "PS-AU." So the commands might be the same, but the modifiers might be a little bit different.

I'm going to try to keep with generic stuff that will work either way. Every UNIX system has manual pages that I'll show you how to look at later if you want to get detailed information about that system. I didn't want to use my normal account because I didn't want to mess anything up, so I created an account called "Hootie." When you log into the system, it asks for your login name and you type it in. It's usually all in lower case, but not necessarily; UNIX systems are case-sensitive in commands, in logins, in passwords, whatever. So, typing the command "LS" is probably going to give you an error because the command is really lower case "ls," for instance. I'm typing in my password, if I can remember it.

It's also case-sensitive, and it's going to think about that for a minute, assuming I typed it right. It tells me when I last logged in and asks for my terminal type. Not all systems do this and this one; a lot of them do, though, ask you for your terminal type. If you're going to be using a full-screen editor or one of the fancier mail programs that have a full screen and might clear the screen and do funky things, it needs to know what kind of terminal you're on.

VT-100 is a very common terminal type, so I will type VT100 and that way most things that we'll do will actually look good on screen. The next thing you'll see when you log into a UNIX system is called the "message of the day" or the "motd" and that's just this garbage that the system administrator thinks that you need to know to use the system, the system down-time being planned or something's running slow or whatever it might be.

Then to get to the prompt. In this case the prompt is "redwood" which is the name of the machine, followed by a percent sign. In most UNIX systems the prompt is the percent sign or a dollar sign. So now that we're here, we're logged in and, like I said, UNIX is a multi-user system so we can type the word, "who" to find out who else is on the system and to prove to

you that hey, there are currently four users on the system. You can even find out when they logged in and where they are coming in from. So here we are.

Probably the best place to start now that we're on-line is to start messing with files a little bit because I think that's what most of us — that's kind of what you work with. Files in UNIX are a lot like files in DOS except there's a mildly complicated permission system. Because since this is a multi-user system, it's not just sitting down at a DOS machine. Whoever's there can do anything they want. You can delete stuff. You can run programs or whatnot. In the UNIX permission system you can do things so that you can change or delete a program or a file, but other people might be able to read it but not actually write to it or run a program. Or you might make it so certain people can do certain things, or you might just have it closed off to the world because you're that kind of person and you don't people reading your stuff. So you can do that on a file or a directory basis and we'll show you how to do that in a minute.

The first thing we can do, the first command that I'm going to tell you about is "LS," [which says] I want a catalog of everything in this directory. It's like the "DIR" command in DOS or like opening a folder in Macintosh. Just see what's in there. You type "LS" and it gives you a list of everything that's in there. And I've created a little test file called "testing," and there it is. So, great.

UNIX file names, unlike DOS file names, can be very long. If you use DOS you're struck with eight characters and a three-letter extension. UNIX systems have a minimum of 32-character file names which they allow. Some UNIX systems let you have file names as long as 256 characters. It depends on the particular system you're using, but you can use pretty long file names. With 256 characters you can write a short letter to grandma just in the file name.

Also, UNIX files do not need to have extensions. A program is not necessarily going to have a .exe extension, although if you use extensions, they are for your own use. The system doesn't need them. It is very common for PERL, a programming language used in UNIX to have the extension .pl. But it'll still work. It'll still run if it doesn't have that extension, but it's easy for you to look at it and go, "Okay." Well, this is a PERL program because it has the extension. Or Hypertech's HTTP files generally have — or HTML files generally have the extension HTML or HTM, but they don't need to. The system doesn't care, but you probably will. So we've got this mystery file called "testing" and we want to know a little bit more about it. We don't know at this point if it's a directory or if it's a file, except that I just told you it's a file, and we don't know how big it is or when it was created or anything.

So we're going to use the "LS" command to find out some more information. And like in DOS, when you type DIR/W or something like that to get a wide view of the directory names or whatever, you can do that sort of thing with most UNIX commands. You can add tags to get more information or get the information presented in a different way. In UNIX you use the hyphen instead of the slash. So, it's "LS-" whatever. If I type "LS-CF" — actually this is a really bad example since there are no directories. Now we have a directory. You can see that the normal file which is just a file doesn't have anything after it. It just has the words "testing," but the directory says www/ and that slash shows you hey, that's a directory. So you can look at it at a glance and tell what it is.

The ls has a whole bunch of different things you can do with the output and the CF — which are, again, case sensitive — give you this particular format for output. Frankly, someone asked me what the capital "C" means and what capital "F" stands for. I don't know. It's just what you type if you want the output. And if you want to know more information about what each command can do, you can use the "man" command.

So we want to know everything LS can do. You can type "MAN" which means manual, space LS. And it will give you a very detailed manual page and a lot of UNIX systems, manual LS tells you everything you could ever possibly want to know about the command. And sometimes

it's just too much information. But this will tell us all about the LS command as soon as this thing actually comes up. The machine we're accessing is a little bit slow at all times. So LS lists the contents of a directory and as you can see here, there are 20 or 30 things you can do with "LS."

Have it list them backwards and sort them and do all sorts of funky things. So "LS-CF" gave us that information and now if we type "LS-L," this will give us long format. And this will give us all sorts of information about these files. You can see over here in this. In the final columns is the name of the file or directory, just like before. I'm going to work backwards through the columns here. The second from last column, tells us when the file was last modified. UNIX keeps track of when a file was created and when it was last changed. So it was changed at that time and this computer is on the West Coast, so the time is not the real time.

Third from last column is the size of the file. So we can look at this and say, okay, this testing file that I created is just under 65K. Here in this column we have who owns the file and since my login name is "Hootie," I created the file. Hootie owns the file. UNIX also has the concept of groups. You can be part of a group of users who might be in the same; you might be a group called "staff" which means staff members. Or I could be a group called "executives" which are the executives of a company. So group is based on your working groups. On this system, pretty much everyone is shoved into a group called "users" because we don't use a whole lot of groups, but imagine that there is a group called staff and a group called executives.

I'll show you in a couple of minutes on how to use permissions to make it so that the executives can look at a certain file, but the staff cannot. The second column with the one or the two is completely not important. I have asked a couple of different UNIX experts about what it's for. Nobody seems to agree, but everyone does agree that it's just completely... it doesn't mean anything to any of our lives. This first column with the cryptic dashes, "RS" and "WS" and that sort of thing tells us about the permissions of the file. And it tells us pretty much who can do what to the file. And those, of course, you can change if you have the permissions group.

There are ten spaces here. The first one... the first space here is either a dash or a "D." If it's a dash, it's a file. If it's a "D," it's a directory. There can be other letters there that mean obscure things like symbolic links, and we're not going to get into that. Basically, you're looking for a dash or a "D." And then we have three sets of letters. There's "R's," there's "W's" and there's "X's." The "R's" mean readable. The "W's" mean writeable and the "X's" means executable. Then there's three columns of that... RWX, RWX, RWX. Again, you get this information about your directory by typing LS, space, dash, L.

In that set of ten letters, the RWX's and all that good stuff, the first set of RWX gives you the permission for the user — if you've created the file, that's you. It's the person whose name appears there. The person who owns the file. It's what that person may do to the file. So, can the user, Hootie, read the file? Can the user, Hootie, write to the file? Can the user, Hootie, execute the file?

Reading means pretty much what you expect. Can you open up a file and read through it? Writing to it is can you delete or modify the file and the execute means if it's a program, can you run the program? And it's possible to set up permission so that you might have a PERL script or something like that that you could read the script, like look at it on-screen, but you couldn't actually run it. So that's for the user.

Then there's the user's group. Hootie is a member of the staff, so he's in group Staff. The system administrator sets up the grouping so a staff member can't decide that he's an executive and get into stuff he shouldn't be getting into. So Hootie's on staff. So, can the staff members that read the file, can they write the file, can they execute the file? And then there's others, and that's the final column of three. And others is everyone who's not Hootie and

who's not on the staff in Hootie's group, basically, and that would be the executives in our example. What can they do to the file? Can they read it, can they write it, can they execute it? And you can change these so that if you want to make it so nobody else but you can see the file, you turn off permissions for everybody else.

M: So, it's just dashes?

Kevin Savetz: That would be dashes, right? If the letter is there, then the permission is on. If there's a dash, then the permission is off.

M: So can Hootie, if he's part of the staff, let's say most of the staff can't execute it, but if you want Hootie to execute it, would he still be able to?

Kevin Savetz: The question was, if the group can't do something, but the owner can, can the owner do something? Yes. It kind of goes in that... the first column is totally dedicated to the user, and if the group can't do something according to permissions, the user can. Then, that's more important. So you can change those permissions and we'll do that in just a moment. Any more questions at this point?

M: You can have as many groups as you want?

Kevin Savetz: Yes, the UNIX system can have a whole lot of groups. There may be a limit, but hundreds and hundreds of groups. Some UNIX systems only allow each user to be part of one group. Some UNIX systems, generally newer ones, allow the system administrator to set it up so that you can be part of multiple groups. I'm not going to get into how that happens because I'm not even sure.

M: So the actual owner of the file could be cut out from being able to use it?

Kevin Savetz: Theoretically, yeah. The owner of the file could be able to write to it, but not be able to read it afterwards. And a couple of times as the system administrator I've had a user come to me and he accidentally changed the permission so that he couldn't read, write or execute the file. So it was useless to him. So he wanted the system administrator to fix that for him. That's also an important point, that the system administrator of the system and that user usually had the login name of a root, can do anything he or she wants to on the system and even if the permissions say he can't, he can read, he can write, he can delete, he can execute, he can run the program. He can do anything he wants to that file.

The superuser or root user is exempt from permissions on the system. So basically, if your employer wants to read your e-mail, they can. Something to keep in mind. So, let's change some permissions here and we're going to change permission using a command called "CHMOD," which stands for change mode.

Hey, our connection just died. I hate computers. Okay. Going to the back-up connection here. Ah, so you're going to talk to me. Very nice. Logging in again. Okay. Good.

So, the CHMOD command or change mode will let you change the permissions on files that you own. And you do that by typing chmod and then a space and then you tell it who you want to change the permissions for and whether you want to add or delete permissions, and then what permissions you want to add or subtract. I'm going to run back over to this again. It's easier to do over here. The pen is dead. Type CHMOD and then there is who and then what you're adding or subtracting and then the permission. And then you give it the file name. Okay?

So, we have to fill in these spaces here. Let's say that this is a file that I want people in my group to be able to read. So, I want to look at the first column. And the first column can be "U" for user, "G" for group, "O" for others or "A" for all. So in this case I want to add "read permissions" for the group, so I'm going to say "CHMOD G" for group. The second column can be a plus or a minus or it can also be an equals sign, so I want to add permission, so I'm going to "+," and the third column can be "R," "W," or "X." So I can say, CHMOD G PLUS R, that is group add readable to the file name and it will do that.

M: [inaudible]

Kevin Savetz: It's CHMOD, space, G + R, space, file name. And if I wanted to make it world-readable or readable by me and by the group and by other users, I can make this CHMOD, A + R...

W: [inaudible]

Kevin Savetz: With the equals sign, you can say "CHMOD A = R." If you're adding permission to something, it kind of assumes that you know what the permissions are. That is, you've taken the time to look. If you know you want it to be readable only, but nothing else, you can just type in "EQUALS THIS" and that's what it is without having really to know what it is already. For the first to the third columns, you can bunch letters, so if you wanted to, you could say... I'm going to be green all day, you can CHMOD "GO," that is group, my group, and others plus "RW" or "RWX," whatever. So instantly with one command, we've said that the group and other groups can read and write the file. It doesn't matter what order you do it in. You could say CHMOD OG instead of GO + RW or WR or whatever makes you happy. UNIX is not fickle that way.

M: [inaudible]

Kevin Savetz: Yeah, you could say "U GO A," although the "A" means the same as UGO, but that's fine, and + RWX... and that means anyone could do anything they wanted to the system and you'll come back the next day and some idiot will have deleted it. But, yeah, you can do that. There's another way to use the CHMOD command that involves a complex numbering system and frankly, that way's easier. Unless anyone really wants to know about the other way, you'll be just fine doing it this way.

M: Is that numbering system pretty much the same as [inaudible]?

Kevin Savetz: Yeah. If you know it, it'll work anywhere, but...

M: Where do you find information on that [inaudible]

Kevin Savetz: The books and the bibliography. I can talk about it if you guys want, but it does the same stuff as what we just talked about, and it's just another thing to write down — and this way's easier to remember, anyway, so... I don't see any murmurs of agreement, so I guess we'll just go on. All right.

This connection is evil. We're going to use the other one. Too many accounts and too many passwords and different screen names. Let's see if we have any files here. Okay. So I've a

file called "testing" I just created. Now on this system, and this really depends on how your system is set up, how the system administrator has done it, also you can change it yourself.

When I create a file it's automatically readable and writeable by me, but by no one else. The default on your system quite probably is different. On many systems when you created a random file it is readable by everyone, but... so anyway. This file is set up right now so that I'm the only one that has access to it, which is good. But this is a file that I want to share with everyone on the system, everyone I'm working with. So I'm going to do CHMOD, CHMOD, other and group plus read permission on file testing.. UNIX didn't say "okay." It didn't say "I understood." UNIX works kind of... I don't know. I think it's counter-intuitive sometimes. If everything has worked well, if it's happy, if it has no complaints, it doesn't say a word. It only says something to you if there's a problem, if you type something wrong or the file doesn't exist or whatever. So no response is good. No news is good news. Type LS, dash l.

The connection just died again. I do hate computers. Can you go find a Meckler person and tell them that Internet [inaudible]. I typed LS dash l and as you would have clearly seen on the screen, it would have been "R's" in all three of the readable columns.

M: How do you do that for a directory?

Kevin Savetz: On a directory, it's the same thing. You can just type a directory name instead of the file name. Directories are interesting creatures. If a directory is readable... we've been talking about files this whole time. Now, thinking about directories, if a directory is readable that means that the group or the others can see the files in the directory, can see the contents of the directory. They may not be able to look at the contents of the files because that depends on the permissions of the files. If the directory is not readable, then other people of the group or whatever, cannot see what the files in the directory are called.

However, if they know that something is in a certain directory and has a certain name, they can read the file if the file is readable. So, directories kind of have its own little structure.

M: How do they [inaudible]?

Kevin Savetz: Well, maybe you've told them what the directory is called and what the file is called. If you know that my directory is in "/user/hootie/testing," but user Hootie is not readable, but I've told you that file's there, then you can get in. Otherwise, maybe by guesswork. Other than that, people won't be able to... It's an odd situation. I'm just trying to explain how...

M: So if you get a [inaudible] command that hootie/, whatever...

Kevin Savetz: Yeah, user/hootie, right.

M: Will the directory that we don't have access to read come up?

Kevin Savetz: It would say "permission denied" or something like that. Unless you were Hootie and you had read permission, in which case then you could do that. Like in DOS — I wish I had the connection for this, but just imagine — if you've used DOS, you've noticed that when you type a directory at top there's a file called dot and there's a file called dot-dot. And just like in DOS, dot means this directory that I'm currently in right now and dot-dot means one directory up. So, if you want to change the permissions on the directory that you're currently in, you can type "CHMOD . A + RX," so that will let you change your current directory. The directory

that you start in, when you log into the system... you start in a certain directory and that is called your home directory. The system administrator sets up how that works. On a lot of systems it's /user/your login name. So, user/hootie.

On many other systems, on the system I administrate, it's files/home/hootie or whatever the login name is. You can find out what your home directory is by logging in and typing "PWD," which means present working directory. I think there's a thing in DOS that does that too, but I'm not sure. It'll tell you where you are. In fact, if you're moving around the system changing from one directory to another, which I'll talk to you about how to do in a moment, and you forget where you are, you type PWD. It'll tell you where you are.

To change directories, the command is "CD" for change directory, so CD space hello will move you into a directory called hello. You go into hello and you decided this isn't what you want. You want to go back up to where you were, CD space dot-dot will move you back up a directory. Hierarchical directory trees just like in DOS. However, something to keep in mind is that UNIX always uses in directories, forward slashes instead of back slashes. And that's something that bites DOS users quite often because you type, cd\user\hootie and the computer is not going to know what to make of that because you always have to use forward slashes.

If you type... This is the last thing I want to add to the LS command that we were talking about earlier. If you type "LS -A" or "LS-AL," if you like that long format, it will list all files; and when we were looking at files before, we've been deceiving ourselves in thinking that we're looking at all the files in the directory because UNIX has the [inaudible] for hidden files. Hidden files start with the "period" character and if you want to create a "hidden" file, you can create a file called ".hello," instead of hello, and then it won't be there if you type LS, but it will be there if you typed LS-l.

Unlike in DOS where hidden files are actually pretty darn hard to find unless you have Norton Utilities or also hidden files, you can't modify, unless you make them unhidden. In UNIX hidden files are not that secure. They're just kind of a way that you can get files out of the way, out of immediate view. For instance, there might be set-up files for your mail program. It might be .elm, if the program is called Elm. Instead of that, it might be called .ELM RC or some... So just stuff to kind of keep out of the way so they don't just bother you and you get them out of view. So, we've had LS-AL so you can see everything. You will see at the top the dot and the dot-dot directory and that's how you can find out what the permissions on the directory is.

The dot directory, the dot files or directory, you'll see the permissions just like on a file and you can find out hey, this directory is readable to the world or is not or writeable or whatnot.

W: Now does the user [inaudible]?

Kevin Savetz: The user? The system administrator. The user can make the changes on the files that he or she owns. You created a letter in UNIX?

W: But directory-wise.

Kevin Savetz: Oh, directory-wise. Certainly. But you can't change anything that you don't own. So, you can change the permissions on your home directory if you want to make it world readable. You can do that. CHMOD SPACE A + R SPACE DOT, assuming you're in it. But you can't change dot-dot or that anything you don't own. Other things you can do with files... hopefully, we'll get a decent connection. I can show you an editor so we can create a file. But once you have a file, "RM" [sets a] remove, and that will erase a file. So RM space testing and

hey... it's gone. Please take note, there is no undelete in UNIX. Once it's gone, it is gone. There is no way to get it back. There is no Norton Utilities for UNIX that will save you.

If the system administrator has bounced it off the tape and is willing to, he might be able to bring back the file, but don't count on it. So anyway, just be careful with the RM command. As with DOS, wildcards will work to RM space A* will delete all the files that start with the letter "A."

Also question marks work. Some UNIX shells, the actual interface they used, have a lot of other wildcarding-type things that are actually pretty advanced. So you can say, delete everything that starts with a capital letter or delete or list or do anything to do something to every file that starts with the letters "a" through "c" and have, an "n" or a number in there. So, UNIX wildcarding can be pretty advanced.

Oh, directories. To create a directory, it's "MKDIR." When you get sick of it later, the name is RMDIR... one word. So, MKDIR space WWW will create a directory called WWW and then to delete it again later, RMDIR. It needs to be empty first, otherwise it won't let you.

M: You don't forward slash [/]?

Kevin Savetz: No. No, you don't. My Internet connection... anytime, anywhere, it just dies after five or ten minutes. It's been really frustrating.

M: [inaudible]

Kevin Savetz: I tried two different sites in California that I have access to. If you can just get me into a UNIX system on site that won't do that, that's great. Thank you.

So, creating directories. UNIX generally has some common...

W: [inaudible] complete directory or do [inaudible] files directory?

Kevin Savetz: I believe you need a copy of the files in the directory. Yeah, and the copy command is "CP" which stands for copies. If you typed CP space hello space good-bye in the directory you're in, it will make a copy of it. As you might expect, you can also copy through a different directory. So, CP space hello space/tmp/good-bye will create the good-bye file in a completely different directory called tmp. UNIX systems have some common directories that you'll see after you've been on a few of them. Unlike in DOS where you might have — if you have twenty hard discs, there'll be C: D: E: F: .

In UNIX the system administrator sets it up so that it all seems to be one big virtual hard disk and it's not your concern what physical drive it's on. So, I guess the equivalent to c:\, just kind of the top of everything, is called the root directory. And that is the directory there is simply slash. Just one forward slash. Under the root directory you will find there are common subdirectories and how things are set up really vary from system to system, but you'll find a directory called usr. A directory called tmp where temporary stuff goes. A directory called "bin," where binaries will go. Programs like LS and CHMOD and that sort of thing. And it really depends on system systems. And we'll say that on our system there are usr tmp and bin. And under UNIX... under usr we might have all of our home directories. So we have usr hootie and we have usr john. And then Hootie created the www directory, so... and again, the neat part is it doesn't matter to you what hard disc [this] is physically on. Just do your work and go on with your life.

For the system administrator, the job can be kind of nasty because he needs to deal with what hard discs are getting full. He or she might have delegated the usr directory on one

physical disc and once everyone starts filling up the space, that person needs to deal with the problem. But luckily, you do not... so.

We have a file in ww called hello. If you're in this directory and you type CP space hello temp good-bye... pretend I can write. It will quietly copy the file to the directory temp a file called good-bye.

W: [inaudible]

Kevin Savetz: You can move files, too. And the command is "MV" for move. MV is just like CP except it deletes the original in the transition. So this will move a copy of a file to a different directory. You can also use MV to rename files. It's pretty much the command to do it. For instance, if we're within the same directory, want to rename hello to good-bye, you just type MV hello good-bye. ...this, for your purposes, hey, rename the file. That's all you really care about.

M: [inaudible]

Kevin Savetz: Because it doesn't. If there was a directory under ww called good-bye, it would actually move the file "hello" to that directory called good-bye. If it didn't, then it would say, hey, there's no directory here. It would just rename the file.

W: Would it still name the file "good-bye," or would it just...

Kevin Savetz: If there was a directory called "good-bye," it would keep it the same name in the new directory. Unless you said, MV space hello space good-bye/good-bye... which would mean move it to the directory "good-bye" and rename it to "good-bye."

W: So, [inaudible]

Kevin Savetz: That's correct. So you can use MV to rename files or to move files or if you're really creative or feeling self-destructive, you can do both at the same time. So we've created, removed directories. We've copied sets of directories. We've erased files and now we need to create files.

M: Before you [inaudible], in this example, if you copied it to tmp good-bye, good-bye or whatever, but you didn't have that directory, good-bye, would it create it then?

Kevin Savetz: No. If you try to copy to a directory that didn't exist... If you try to copy it to the directory, tmp good-bye good-bye, it will not create the directory for you. I have a couple of times mistyped a directory... I was just trying to move something with the same name to another directory, but mistyped the directory name and you end up renaming the file to the mistyped directory name. UNIX is very powerful in many things. This and other things. It's very powerful but it lets you bite yourself in the butt if you're not careful. So, you just have to be careful.

There are several editors in UNIX and just basically for creating files. A couple of them you'll find in just about every UNIX system. A couple of them aren't necessarily there, but your system administrator may have added them to the system. UNIX system editors are... none of them are very easy. Some of them are easier to use than others and none of them are as easy as loading Microsoft Word or just typing. The main UNIX editor that a lot of people use is

called "VI." It stands for Visual Editor. You figure it out. And VI is very common. You'll find it on any UNIX system. It's not so easy to use. It's moderately [inaudible], but it's very common and it's pretty darn powerful. Another very common one is EMACS and that's free software which is not installed by default on all UNIX systems, but it's very popular and pretty much any system administrator will have installed it on the system.

EMACS is very powerful, moderately common and in my opinion, really hard to use. I tried to learn it a couple of times and I just gave up and went back to VI. But it's very powerful and it does searching and replacing, and you can do so much with EMACS. In fact, EMACS is actually an entire programming environment and if you want to play games within your word processor, you can do that with EMACS, so it's a very, very big, complicated thing.

And the other one that I'm going to talk about is called PICO. PICO is less common, but really easy to use. It's really intuitive. You just start to type. You don't have to go into insert mode and there's always commands at the bottom of the screen.

Have you ever used WordStar or any of the... you want to save, there's a little row of commands at the bottom. If you want to save, you hit Control-S to save and if you want to quit, you hit Control-Q. And there's actually commands on the screen to remind you of these things which is not really true with the other editors. Thankfully, this is not a UNIX editor tutorial because I would die and you would die of boredom.

M: Is PICO a [inaudible]?

Kevin Savetz: PICO is part of the Pine mail distribution package, and is freeware. And speaking of mail distribution packages, I'll talk quickly about some of the e-mail programs that are out there.

Pretty much every UNIX system has a program called "mail," and usually that's a very simple mail program that will let you read your mail, send your mail, but it's a command-line interface and not all that user-friendly. No on-line help, but it does the basics of letting you see what e-mail you have from users of that system or from the Internet. On many systems are the two other very common mail packages.

One is called Elm, like the tree, and one is called Pine, also like the tree. Elm and Pine are both kind of full-screen graphical e-mail clients. Basically, they are menu-driven. There's a lot of on-line help. They're just like... just hit "M" to send a message and then it prompts you and asks who you want to send it to. You type the address of the first subject. It kind of walks you through it. Elm and Pine basically... try them both. See which one you like better or if there's [inaudible] on your system and not the other, well that's the one you're married to. I happen to like Elm better. A lot of beginners like Pine better.

Any questions at this point? I'd like to take a five-minute break for stretching or whatever and get some tea and then we'll come back and move on to something else. Our Internet connection, he's basically said that it's going to be flaky and we can use it for short periods of time, but it might die at any moment. So, I'm just going to try to not do that and it'll probably give us a little bit of extra time for questions at the end, so think up some. Somebody back here had a question when we were leaving and I was going to... I just don't remember what it was now. Okay.

M: I wanted to know as an executable file, how to find it.

Kevin Savetz: Oh, right. Does the executable... you type Elm or Pine or whatever program you're going to write, does it have to be in that same directory as you? And the answer is no. Like in DOS, UNIX has the idea of a path in certain places, and the computer will look when

you try to run a program that it can't find in your directory. The system administrator generally sets up a path for everybody which looks into basic places such as `usr bin` and the `bin` directory, and a program's connection can be spread out in multiple places.

If you want to change your path, you can do that as well. If you create your own directory somehow that you want to put binaries in...

M: [inaudible] in browsing the Web?

Kevin Savetz: The question is about CGI BIN, the CGI BIN directory. The CGI BIN files are programs that people on the Web can run. All the cute things that you see on-line where you get updates every ten seconds to something or a thing called "foam bath fish time" where — it's a clock and little bath toys. Things that you can do on the Web are done with what are called CGI BIN scripts, and that's a separate directory on the system where those programs are. And usually those programs are world executable.

However, in the specific instance of CGI BIN, they are... there can be a security risk because basically anyone in the world is going to run this program, so a lot of assistant administrators kind of clamp down and make sure that you can't put stuff there willy-nilly. So, does that answer your question a little bit?

M: Do I have [inaudible]

Kevin Savetz: They have to, right. If you have a program that you want to be executable on the Web, it has to be generally in the CGI BIN directory. There was a question back here.

M: I'd like to take a step back. How do you load Elm or Pine on a system if [inaudible]?

Kevin Savetz: If it's not on your system at all? It is the job of the system administrator which I — that would be you — to find the package. I was going to do this later, but this seems like a good time. When you're installing anything... Elm or Pine or hey, you're putting up a Web server and you need to actually install it, there are several steps involved in that.

The first one, as you might expect, would be to find a program, to choose one to use. If you know you're looking for Elm and Pine, then that's easy. You just use *Archie* or whatever to find it.

But often times hey, I want a Web server or I want a mailing list management program for UNIX. But I don't know which one. And picking the right one is often your real first task. The way I do that is I check UseNet news groups talking about that particular topic. I won't be able to get it right, I'm sure, but there is a UseNet news group just for talking about Web servers, `comp.sys.web.servers` or something like that. I don't recall right now.

Basically, start reading and seeing what people are complaining about and what people like. Also, use the WorldWide Web, *WebCrawler* or *Yahoo* or whatever your preferred search tool to search — most of these tools have pages that will detail the benefits and downfalls of each different package. Specifically, mailing list programs we were just talking about earlier. Looking for one, and there's basically a big table that says "Here's what *ListServ* will do. Here's what *MajorDomo* will do. Here's what [inaudible] will do." And based on that, I'm using a mailing list program that nobody's ever heard of called *SmartList*. But for my needs, it's very powerful and it does the job.

So you find the program you want and generally, as I said, there's a Web page out there somewhere that will help you choose the right thing for your needs. And you have to download to your system and that involves FTPing it to your UNIX system. FTP from UNIX... you run the

FTP program and you just type FTP space where you want to go: aim.stanford.edu. And then — I'm sure most of you are familiar with FTP. It asks you who want to login is. You type "anonymous," type your e-mail address as your password and then once you're in FTP, if you ever use [inaudible] spoiled by [inaudible] on the Mac or FTP graphical clients on Windows, you know what text-based FTP looks like and you'll notice if you've done that it's very, very UNIX-like. You type LS, you get a directory. You can type cd space whatever to change directory.

So, step two is you go to the site, you download the software to your system. Use the "get" command in FTP and now you have this big file of stuff on your system. Some programs are available in pre-compiled binary form. Those are good if you can find them. They'll end up saving you a lot of work.

Some, however, are available only in source code format. That is, raw C code or whatever that you are going to need to compile before you can run the program. I suggest looking around and if you want to save some time and you're not doing any really fancy customization to try to find pre-compiled binaries for your system, it'll save you a few hours of frustrating time trying to compile. The problems with pre-compiled binaries is they are not available for... sometimes they are not available at all. And often times when they are available, it's only for the major systems. You can find them for Solaris and maybe [inaudible], but you won't be able to find it for Joe Bob's UNIX company, for UNIX implementation.

So if you have something that's not one of the big three or the big four, then you might have to compile it yourself anyhow. So, you get your program and when you download a big program such as Elm or Pine, we'll say, you're going to notice the file name looks something like this. It might be, let's say, Pine. Pine-distribution.tar.z. A made-up file name, but it'll look something like that.

So, you've downloaded Pine and in your directory you've got "Pine dash disc dot TAR dot Z." Looking at this file name you can tell that this file is compressed and it's also an archive. If you've ever used [the] PKZIP program on DOS or StuffIt on the Macintosh, then you understand the idea of an archive and of compression. Basically, it takes a bunch of information and shoves it into a small space. It also gives you the ability to take several different files and put them into one file. Just [for] ease of distribution and transport on the Internet. In UNIX, the UNIX COMPRESS tool only does compression and the UNIX archiving tool only does archiving.

So if you used ZIP, you know that it will do both, but under UNIX it's two separate things. That's why we see the dot Z... a dot capital Z means it is compressed and the dot TAR means it is archived. So now we have this program and we want to turn this into something useful, so at the prompt, which I'm seeing is the dollar sign here, you type "UNCOMPRESS file name." It's a capital Z. And it will uncompress the file. And as always it won't say success or anything. It will just very quietly do that. And if you type LS again at that point, you're going to see that your file is called... it's going to rename the file so it'll be just pine-just.tar. It's not compressed anymore, so it takes away the dot Z extension for you. Now we have a TAR file which is still a big messy tape archive... that's what it stands for although we're not using tapes. It's just an old program called tape archive.

Now we have this old thing called TAR that we need to untar or unarchive so it's a whole bunch of little programs and files instead of one big one. So you're going to use the TAR command to extract the archive.

M: [inaudible]

Kevin Savetz: Pretty much any system you can possibly be at that's UNIX will have the uncompress and the TAR commands. So TAR is an amazingly complicated program and I don't

know what all these things mean. I just know that this works if you want to uncompress — rather unarchive — something, TAR space dash XFVMO space the file and then it will give you output as it creates information. In the specific case of Pine, Pine is a huge package and it will take up 15 megabytes of disc space and source code and all these directories and it makes a big mess on your hard disc. But that is the command you use to untar something.

Very recently, in the past few months, a new compression scheme has come up for UNIX systems and it's taking a foothold, although it certainly hasn't taken over the very common dot capital Z compression scheme. And that system is called "GNUZIP" and if you see something that's filed dot GZ, then you know it's gnuzipped.

And if you want to install packages, mailing us programs or Web servers or whatever it is, you may come across dot GZ's. Luckily, it's better... it's a little bit faster. It has a little bit better compression, but what affects your life is it is a compressor and an archiver in one program. So you get to save a step. Oh boy.

So if you've filed that GZ, you can type GNZIP file dot GZ and it will uncompress and unarchive the program in one fell swoop.

M: Where will it end up? I mean, can you direct it to a specific directory or will it just [inaudible]?

Kevin Savetz: Generally, with either TAR or GNZIP, it will end up in directories underneath your current directory. So usually when I download something, I create a directory called "working" and any garbage that the archive gives me is all safely under the working directory. That's pretty much a good way to do it. And then you can move it around. But at this point we're talking about source code or even if it's binary stuff that needs to be installed and most of these big packages have an installer and it will put stuff itself where it really needs to go down the line. So you type GNZIP and you have created a whole big mess of files. Quick tangent.

If you want to compress something with the old style compression, you type COMPRESS instead of UNCOMPRESS and so compress space file name... it'll compress it or rename it to file name dot Z.

If you want to zip something with gnuzip, you can type GZIP and it'll tell you how to do that. COMPRESS and UNCOMPRESS are pretty much available on any UNIX system; however, GZIP and GNZIP are not necessarily there and if you're the system administrator, the first time you may have to get it. But it's pretty popular and pretty easy to find if you use the standard in that searching tool.

So, we've uncompressed it, we've untarred it or done whatever we need. And now the fun begins because now you have to figure out to get the sucker installed on your system. If it's pre-compiled binaries, there is probably a program, an executable called install or READ ME or whatever. So, you read the READ ME, you run the installer, you do whatever you need to do and it puts it in the right place. If you've gotten source code, you need to compile it yourself. I'm not going to get into that whole big mess.

The most things that you'll get in source code on UNIX or in one of two languages, they'll either be in PERL or they'll be in C, spelled "C." Those are the two big languages. You'll find others, but not often. If you need to make something out of source code, generally you'll find a file called "Make file" with a capital "m" and that's where you'll find the things that you'll need to modify to your system. System specific stuff. You might need to know who the system administrator is or just system specific things that need to be in the program itself and the reason that they couldn't give you pre-compiled binaries. So you look at the Make file and then you type "MAKE" and it starts to compile and come back two hours later and you find that it's done and nothing has gone wrong. And then you wake up from your little dream world.

So, in a nutshell, that is how you find and compile and get something installed in your system. As I said, for the major packages, they're pretty easy. Either they're pre-compiled or they have a nice little installer that does the hard work of figuring out your system with specific system information for you. Smaller programs might not be distributed as well. You might just get [inaudible] files and do it yourself. I know a little bit of C and I just generally throw those programs out because I'm lazy and it's a lot of work to get some things in stalled, so...

Any other questions at this point? Okay. I'm not sure where to go next, then. Not having a computer in front of me has thrown me off my track. There is... let's see if I can login and I'll show you a little bit of GREP. Now is the time when I show you random other UNIX commands that we don't fit neatly into anything else. Thank you. I'm doing this very quickly because this connection will not last that long.

I showed you the WHO command earlier; it shows you who is currently on the system. FINGER is an Internet tool that you may have heard of in its own right which also, by itself, tells you who is on the system. You can also use it to find out who is on other systems. If you know that... hey, you want to know, someone gives you their e-mail address or you just want to Finger a site, a can type "FINGER" and the address and it will let you know about a particular single user on another site.

So "FINGER" by itself tells you about who is on your site. Finger address at another site will tell you about a particular person at another site. Let's see if I can bump the size up of this just a little bit. So I just fingered one of my accounts and you can find out the information that I have put up there. Now this is pretty basic Finger information. The login name, the person's directory, their real name and when they last logged in and sometimes if they have any unread mail. It'll put that in the Finger information.

Now, there is a bunch of information that I put there, not the computer. And this is called a Finger file or a Plan or usually dot Plan. And that's a file that you can edit yourself and it goes in your home directory and it's called "dot plan," all in lower case, and if you create that file and enter — our connection has died again — you can put information up there about who you are, what you do, anything you want and that's kind of a nice way to say "hi" to the world. And so if people are looking for you, they'll find you.

Again, in your home directory, it's called "dot plan." It's one of those hidden files. That's why it starts with a dot. And after you make one, you need to make it world readable because people out in the ozone are going to be looking at you so [inaudible] and that way you can just get the full information about you. Another useful UNIX command is called "GREP." It stands for something really obscure that I can never remember.

GREP is a way to filter through a file, to pull out particular lines with particular information. For instance, you might have a text file with a list of people's first and last names. You can use the GREP program to go through that file and just show you everyone whose last name has "Smith" in the name. And the way you do that... and GREP is just about on any UNIX system that you'll ever, ever come across.

So if you have a file called "test," you could say GREP smith test and it will go through the file called test and print out on the screen any line that has the word "Smith" in it. This is case-sensitive as always, so capital Smith will give you everything with a capital Smith in there. GREP is one of those commands that you can do 30 different things with. It's pretty powerful; GREP dash V, a search thing and a file name, does reverse and it will give you every line that doesn't have a particular line in it.

M: [inaudible]

Kevin Savetz: Yes, and I think you have to put it in quotes if you're searching for a phrase. So now, you type `GREP Smith test` and it just gives us the 300 names of people with the last name smith who came to the Internet World Show. That's not very useful on our screen because we want to do something with that. UNIX has the ability on any program, you can redirect the output to another program. And that's a neat thing about UNIX is that every command is actually a program and if you don't like the way it works, you can rewrite it, but the nifty thing is so you can take [output out] of a program and send it to another program.

So, there's a program called "`SORT`." So you could say, `GREP Smith test` and we can send it to the program, `SORT`. And the way you do that is you use the pipe, the vertical bar character [|] — sometimes it has a break in the middle of it. It's called the pipe in UNIX, so "`GREP space Smith space test space |`" to another program. So we want to sort it. Hey, there's a program called `SORT`. And now it'll dump to your screen a list of alphabetically sorted names. In this case if it's first name, comma... if it's first name space last name, it will actually sort them by their first name because it's just sorting alphabetically like you told it to. If you didn't like that, there's a program called "`CUT`" which will cut fields out of text files so if you only want to see the last names, you can do that. You can mess with information in a whole lot of different ways in UNIX.

Another way that you can use Pipes to do things is you can run a program and instead of sending out [inaudible] your screen, you can mail it to yourself in e-mail. This morning I wanted to run a program that I knew would take a couple of hours, so I typed the program name and I typed in "`program`" and I piped it to `mailsavetz@northcoast.com`. So it ran the program and instead of dumping it to my screen where I didn't really want it, it would mail it to me and I could just deal with it later next time I logged in.

Oh, a very simple and useful program is called "`CAT`" and it stands for "Concatenate." Concatenate is an obscure word which means to append things to one another. In its most simple — I am a grammar person, you can type `CAT file name`. That just dumps the contents of the file to your screen, so you type "`CAT space test`" and if test is a list of ten names it'll just put them on your screen. The reason it's called `CAT` is because if you had test, test 1, test 2, test 3, you could type `CAT space test one space test two` and it would put them all on your screen in a row, appending them. If you want to print, assuming you're at a computer that can, a UNIX machine that is set up with a printer, the command is usually "`LPR`" which stands for line printer. Some machines have a better print program called `PRINT`.

So you type `LPR space file name` or `PRINT space file name` and it will print the information. However, if you're dialing in from Boston and you're talking to a computer in California and you type "`PRINT`," hopefully the system administrator has set it up so this won't work, but if not, you could end up printing stuff in the computer several thousand miles away. It doesn't know where you are, but you're logged in. If you have the permissions you have the permissions, so it won't necessarily print on your printer. It will print on the printer that is connected to the UNIX system. You can print. And that's a function really of your terminal program.

For instance, the Telnet program that I'm using has a capture function as do some for Windows. But if you're sitting in the home terminal or something, you may not be able to print at all if it doesn't have a printer attached to your machine.

M: [inaudible]

Kevin Savetz: `PING`. `PING` is a program... actually, Ping is an Internet protocol and it is also a program on UNIX. One of those rare cases that the thing is actually named correctly for what it does. Ping lets you find out if another computer on the Internet is alive, is awake and actually

on the Network right now. So if you type PING redwood.northcoast.com it will say, "Hey redwood. Are you out there? Do you exist?" And if so, it will say, "redwood is alive." And that's all you need to know. Also, on many implementations of UNIX if you type "PING -S," it will tell you exactly how many milliseconds it's taking for packets to get to redwood and come back. So you can find out, "hey, do I have a fast connection or do I have a slow connection?"

M: [inaudible]

Kevin Savetz: Right, so it's very, very useful. For instance, if you're on a system and you're trying to tell it [inaudible] and it's not working, trying FTP and it's not working, you might try pinging your router or the next machine in the line. "PING-S whatever it's called," and it will either — I think it tries for a while and then it says, "redwood is not alive," or something like that. It basically will think about it for awhile and say, couldn't get there.

W: But how do you know [inaudible], how would you know that?

M: Is there anything that tells a browser [inaudible]?

Kevin Savetz: Basically, in answer to your question, you might ask your system administrator, what is our router called? And that way you can do some basic troubleshooting yourself. Because if you can't get to the router, then there's a problem and you're not on the Network because the router isn't. There's a separate program called TRACE ROUTE which is not default on all UNIX systems, but if it's there, that's what it will be called. And if you type TRACE ROUTE redwood@northcoast.com, it will tell you every machine between you and the destination. And it's kind of cool.

If you're here in Boston and you type "TRACE ROUTE," there might be five or twenty or more machines. And it will give you the names of them and you can look and they'll have these really cryptic names so you can go, "Hey, my packet is leaving Meckler and it's hitting ANS and then it's going on to SprintNet and then it's traveling through a bunch of routers and it's reaching its destination." And if you try to trace route and it doesn't do anything, then you've lost your Internet connectivity. Also, it's kind of a good way if you want to seem like a smart guy to your system administrator, you can say, "My packets are getting as far as SprintNet, but not any farther. Fix the problem."

M: It tells you when it stops.

Kevin Savetz: Yeah. Well, it tells you the last machine it can successfully get and, of course, the Internet is pretty robust. If there's a way around, it'll try to find it. But sometimes a key machine is down and it just can't get there, so... Other Internet tools, there's PING, there's TRACE ROUTE, there's FINGER. We talked about MAIL. We talked about FTP, also TELNET. Basically, you type TELNET space the place you want to Telnet to and it does the basic Telnet protocol interface type of thing. It's fairly simple. I think those are the big ones. Any more questions at this point?

M: [inaudible]

Kevin Savetz: I'll talk about those in a minute. I'll touch on them. After CAT, which will basically dump stuff to your screen and in my little demonstration, I would CAT a long file in it with a scroll away... not very useful for long information, so there's a program called MORE which is

basically just like on DOS. You can PIPE something to MORE and it will give you a screenfull and say "More" at the bottom of the screen. If you want more, you hit the space bar and it will give you another page. Actually, there's two ways to use More.

You can just ask "Is this a file name?" with a file that you just want to look at. You can type More file name and it'll do that. Or you can take the output of anything and PIPE it to MORE. So, basically, you can run a program that will tell you the last 300 people to log into the system, or you might just be rerunning a database program that's going to run for a while and give you a lot of output, and you just want to look at it a page at a time, so you PIPE it to MORE and then it will just give it to you a page at a time. That's standard on all UNIX systems.

Some UNIX systems have a program called LESS, which does the same thing as MORE, only better. And as they say, LESS is MORE. Not necessarily on all systems, but it's a little bit more functional, a bit nicer, and if you've got it, use it.

Shell scripts are collections of commands, basically collections of UNIX commands that you put into a file, make that file executable because it's really a simple program and then when you run the program, it'll do all the commands that you want in order. So, in its simplest form... for instance, there's a shell script for every user in your home directory, a hidden file called dot login. And when you log in, it runs the shell script which basically it does things that we saw when we logged in. It shows you the message of the day, it asks you your terminal type, sets some permissions on things and does some basic... it's basically a collection of commands to run. There are different types of shells. We have been using a shell called the "CSH" which is a fairly standard and that's written out as CSH, but is pronounced "seashell."

If you've used DOS, you're familiar with command.com which is the basic shell, but you may also have used something called ForDOS, which is a replacement shell for DOS and it has all sorts of funky things, where if you hit the "up" arrow it will page through the last few commands that you've typed. You can type... it has a bunch of extra functions that aren't in the normal shell.

Well, in UNIX, there are probably about ten different shells that you can use. The standard basic one is called the "Bourne Shell" and that is just written out as "SH." Just shell. And then there's the "C-shell" and there's the "T-shell" and there's the "Bourne Again Shell" and there are a bunch of different shells and frankly, I'd just use whatever you are given unless it seems really under-powered to you. Shells might let you get a history of the last 50 commands that you typed, and if you just entered a very long command, you could say, "Okay, do the command I did eight commands ago. Just do it again. I don't want to have to type it." Some shells let you have aliasing. It's very common.

If you type LS-CF a lot, you can just change that so it's LS [inaudible]. So you can save some keystrokes there, save typos if you always type CTA instead of CAT... whatever. You can do aliasing and very simple or very complicated aliases. So, some different UNIX systems have many different shells installed and you're probably given one by default and if you want to change it, there's usually a command called "CHSH" which means "change shell" and then you can change between the different shells in the system. Basically, it's just an interface thing. It only has to deal with you. People can have different shells. It doesn't matter which one you use really except for what you prefer.

M: [inaudible]

Kevin Savetz: Yeah, there is a command... The question was how do you find out what shell you are using? There is a command called "PS" which means "process status," and basically this is a command that will tell you what programs you are currently running. Since this is a multi-user interface, you could be logged in for multiple places, a bunch of different terminals, or maybe

you walked away from a terminal and forgot to log out. If you typed PS, it will list everything that you're doing.

[Tape change]

Kevin Savetz: ...whether you're running, you can just look at the column there and see whether you're running C-shell or Shell or the Cornshell or whatever.

W: [inaudible]

Kevin Savetz: On most systems, if there are multiple shells, you as the user can change your shell by typing CHSH.

M: You could learn a special set of commands [inaudible].

Kevin Savetz: Yes, aside from the UNIX commands, there are a special set of commands just for your shell. O'Reilly & Associates publishes a whole bunch of books. O'Reilly publishes a bunch of different UNIX books and if you want to learn the intricate details of the C-shell, you can get a book just on the C-shell or the Cornshell or whatever. But for the real basics of UNIX, just type the commands. You don't have to worry about the real details of the shell. There's a question back here?

M: [inaudible]

Kevin Savetz: Your operating system, like on the Mac, the UNIX is the OS, but the Finder on the Macintosh or Windows is your shell. But, unlike on the Mac, you can change your shell if you don't like it. That's powerful. Speaking of change shell, there's another one called "CHFN" which is "change finger name." As I said, when you Finger someone, you can find out what their name is. What their real name is and [if], for some reason, you don't want the world knowing who you are, some UNIX systems have CHFN, so you can change your name, just have your last name, for instance, if you wanted to.

Also, you may be able, with CHFN, to put your office phone number so people won't have to call you via other means rather than sending e-mail, although I don't know why anyone would want to do that. You can put other information about yourself using the chfn command. One of the things I was going to demonstrate, but it's just not going to work was setting up a very simple Web site on a site that already had a Web server.

Some Internet service... Just to kind of put some of these ideas together, some Internet service providers such as North Coast Internet have a Web server and they let users create their own personal Web space. And the way they do that is they tell you, "well, you have to have a directory call www." Sometimes it's called "public_Web" or something like that. And anything that you put in that directory will be available on the WorldWide Web and it's a nice little way for people to say, "Hi, I'm Kevin. Here's my Web page."

Now that you have learned that as well as a couple of others that I'd like to touch on, we're going to pretend we have some UNIX that are connected and so... on North Coast Internet, for instance, and as I said, this is fairly common, you need to have a directory called www and so we're going to make a directory under our home directory called www, and that's where all of our Web files are going to go.

Since these files are going to be readable by people all over the world, this directory and its contents needs to be world-readable and world-executable. So, we're going to create the

directory and then we're going to type CHMOD A + RX www. So now we have a directory. It's readable. This is where our little work of art is going to go. And then, CD worldwide web, www.

So now we're going to move into that directory. If you type "LS-l", you're going to see that there's nothing in there yet. Now we want to create a home page. And it's going to be called "welcome.html." A couple of ways to do this: you can use the VI or the EMACS or the PICO editor to go in there and create it, or something that a lot of people prefer to do is you can use your PC or Macintosh to create the information and then upload it to the UNIX system. You might be more comfortable with Microsoft Word or you might have a big graphic that you've created in Pagemaker, I'm sorry, in PhotoShop. So we want to upload some information to the system.

Basically, you can use whatever tools you're familiar with. Make sure that any text is in text format because UNIX won't understand a Microsoft Word document, for instance. And then you're going to FTP it from your machine to the host computer. That involves firing up FTP on your machine and then logging in with FTP.

Now, since you have an account on this UNIX machine you're not going to be using anonymous FTP, and 99% of the time, if you have FTP, you don't have an account on that system so you're using anonymous. But since we have an account on this machine, rather than logging in as anonymous, we're going to log in as Hootie or whatever a login name is. We're going to use our password and you're going to find yourself in your home directory under your FTP [inaudible]. You're going to change into the FTP directory and then you're going to put the files that you want to put.

So we use our FTP tool to upload a HTML file called "welcome.html" and, of course, only ".htm" if you're using Windows because [characteristic of] DOS, you only get three letter extensions, that's okay. And we're uploading picture.gif. So they're now on the UNIX system. Is there a question?

We quit our FTP client. We go back into Telnet, so we got the information there. I've found that on many FTP clients, when you upload information, it gets the permissions really funky. On Macintosh, the two programs I use a lot, Fetch and [inaudible], they leave everything world-writeable, so any idiot can go in there and start messing with your information. So, that's bad. So now we've uploaded our stuff on the www directory.

M: [inaudible]

Kevin Savetz: Yeah, I think you can. [Inaudible] just came out and it's still in beta and I haven't played with it a lot, so you upload your goodies and then we're still in the Web directory so we can "CHMOD OG-W*". Okay? So, now it's not world-writeable. Everything that's in there is now writeable by the user and just to make sure that everything is readable, we can "CHMOD A+R*". So, we've made sure that everything is readable, but is not writeable. And now you type "LS-l" and you'll see that you have two files there: "welcome.html" and "picture.gif."

Uploading from DOS machines is interesting because DOS originally had three character extensions and also DOS machines don't differentiate between upper and lower case. So you may want to rename your file from WELCOME (all the capitals) dot htm to MV, use the MV command to rename it to be welcome (lower case) dot html. If you want to. There's no need to. You can leave it dot htm if you prefer, but UNIX is case-sensitive, so if you're pointing to picture dot gif all in lower case and it got... when you uploaded it, it got uploaded as all capitals PICTURE.GIF, it's not going to be a valid link because capitals and lower case matter.

So that's pretty much it. You CHMOD it. You make sure that the file names have capitalization that you want and it should be on the Net and in many cases, on most systems

that I've seen it's done with and this is not a hard and fast rule, the URL is the name of the site and then a "tilde," [~] the user name and then the file name. This is just for public access UNIX. So in this case <http://www.northcoast.com/~hootie/welcome.HTML>, which is "welcome.HTML."

M: What does the [inaudible] do? It automatically sends you to...

Kevin Savetz: The tilde [~] basically tells it that this is a user directory. It's not something that the system administrator set up. It's not in the main directories for HTML. It's off somewhere else, so. And it also kind of guarantees that in this instance that people out in the world can't get into stuff in your home directory. They can't go through your files. They can only get into stuff in your www directory, which kind of protects you a little bit. Yes?

M: [inaudible]

Kevin Savetz: Nope. No reason to have HTML on your files at all. If you cruise the Web, you're going to find that 90% of the Web pages are going to have dot html extensions, but it's convention. Other than that, there's no reason for you to do it. You can have no extensions if you want. The UNIX machine doesn't care. It will serve the information either way.

M: I'm sorry. I just sort of missed that [inaudible]. That is put in by the system administrator [inaudible].

Kevin Savetz: If the system administrator has set things up so that any user can create a Web page, the general convention is that the URL for that is the name of the machine and then tilde, the user name slash. And that just basically says this is a user Web page. The tilde generally means home directory.

M: Okay. And you can't [inaudible].

Kevin Savetz: It depends on the system, but usually no. But then again, if you're the system administrator you can set things up any way you want and you don't have to deal with the tilde at all. If you are the system administrator, then there's generally a place called the root HTML directory which is where everything else goes. Things [inaudible] especially user accounts. So if you have an on-line shop, you would say, "well, the root directory of this on-line Web store is on the UNIX system in slash/user/web" and everything under there is basically the Web directory that you have set up yourself. Okay? Yeah.

W: I don't quite understand [inaudible] you don't need an HTML tag, but say for example, you're using Windows and you're creating a Web document maybe like in [inaudible] and then I want to ask you [inaudible].

Kevin Savetz: No, you don't. The question is if you've created it on Windows with "name.htm", after you "P" it up to the UNIX system, it's still going to be named that HTML, you don't have to rename it.

W: [inaudible]

Kevin Savetz: UNIX itself doesn't require the naming. The Web server in question may require things to be HTML. I hadn't thought of that. So, yeah, on your system, I suppose that was the

case, it requires... it needs to have the HTML, but in this case it's the Web server that's requiring it, not the UNIX system itself.

M: [inaudible]

Kevin Savetz: Right. On some Web servers. Right. That's why I use that name because [inaudible] on many servers. Any more questions at this point? I'm open to going off in a minute. My canned spiel is pretty much done so I can go anywhere at this point.

M: [inaudible]

Kevin Savetz: If you tried to look at a GIF or anything that's not text [inaudible], for instance you've got CAT picture .gif, your screen is going to fill with garbage. It would be like taking a GIF file and feeding it to Microsoft Word or any word processor. You're just going to get garbage.

A way to find out what type of file it is, if the extension isn't helpful, the last [inaudible] you can type "FILE file name" and it will try to figure out a little bit about the file. It will say file name is [inaudible] text or file name is an executable program or it will look at the file and try to figure out what it is for you. You might not be able to say, hey, this is a GIF file, but it can say, this is data, you know. So you'll know not to type CAT file and [get] garbage all through your screen. Yes sir.

M: Do you have a user menu [inaudible]

Kevin Savetz: You have a menu on your system and you want to change what's on it and you don't know what it's called. Start searching. Just kind of look around. If you use the user menu, you probably run a command to bring that menu up... maybe? No? I don't know.

M: Well, actually, we log in [inaudible].

Kevin Savetz: When he logs into a system, it automatically comes up with a menu instead of the UNIX interface and that means that under your account, probably in the dot login file in your account, it says instead of running the shell, we're going to run a particular program. And honestly, it depends entirely on your system, how it's set up as to if you can change that menu at all or if you can avoid using the menuing system at all, it really depends on how your system administrator set things up. If it set it up to be real secure, then you can't avoid it and you can't change it. But it may not be.

M: [inaudible]

Kevin Savetz: Yeah, probably a default login file. The other thing that the system administrator could do is set your default shell instead of being C-shell to actually be the program, be the menuing system, so... and that's something that the system administrator sets in the password file or if you can get to the chsh, the change shell command, you may be able to change that.

M: How many commands [inaudible]

Kevin Savetz: Oh, probably... I don't know, 15 or something.

M: Can you survive with that or how many [inaudible]

Kevin Savetz: Well, so far we can... assuming you learned your editor yourself, you can create a file, you can delete it and rename it and move directories around. You can create a Web page. So, at this point, and you can even search through files for certain information, so at this point that's a good portion of the UNIX basics. Once you know how to have a mail program installed, you can do some of those slightly more moderate things you can do as well. So this is really, you can get around... and, of course, you're going to sit down and use the machine and the first thing you're going to do is going to be something that we haven't talked about.

But as far as basic file manipulation, directory manipulation, those are the big commands. And if you want to know more about a particular command, you type man file name and it will tell you about that command and also about related commands as well. And again, very soon, the bibliography that I gave you, the URL, will be on-line so you can get more information from this book. Yes.

M: So with the Web pages [inaudible]

Kevin Savetz: For Web pages, they basically need to be world-readable, that's a plus r. Because basically, a person out in Finland looking at your Web page, he's out there. He's no one to the system so it has to be world-readable. For any Web directories, that is directories with HTML code in them, those have to be readable and executable.

M: [inaudible]

Kevin Savetz: The directories have to be executable because the people are going to be looking in them. They are basically looking for files in them.

M: What's the difference between executable and readable?

Kevin Savetz: As far as a file goes, if a file is readable, that means you can look at the contents of it, but not run it if it was a program. An executable... for instance, a shell script or a PERL script needs to be executable if you want to be able to run it. If a directory is executable, that means people can look inside of it.

M: Oh, I see. Versus if the directory is readable...

Kevin Savetz: Now I'm confused. Just make them executable and readable. I'm sorry. It's been a long day. If it is executable, then people will be able to run programs inside of it. If it's readable, then people will see the content of it, I think.

M: Hypothetical. Suppose you wanted to set up a UNIX machine in your den to play with it.

Kevin Savetz: You're a sadist. Rather, you're a masochist and you've set up your own UNIX machine in your den. Okay.

M: What sort of minimum configuration is required?

Kevin Savetz: What sort of minimum configuration is required? It depends on the type of UNIX that you're running. For instance, [LYNX] which is a freeware, completely public domain

version of UNIX requires — and which is very good, by the way — it requires a 386 with eight megabytes of memory. So, not an overly-powerful machine. And basically a CGA monitor is enough because you're just doing text. [LYNX] is something that we haven't talked about and I don't really, honestly don't know very much about it. Some versions of UNIX has something called X-Windows which is a graphical interface to UNIX which is a whole lot like using Windows or using a Macintosh, with the mouse pointer and the buttons and the clicker and things you click on and everything.

And if you want to use X-Windows as well, that will probably require a VGA monitor and probably some more memory, 12 megs to move all that information around. There are a couple of versions for UNIX for the Macintosh, although I don't know what you'd want to do that to your Mac. One is called Mac-10 and that's commercial software, \$500 or something like that, and there's another one that's a Mac version of [LYNX] which is just coming out and is in beta testing, I believe, at this point. Other versions of UNIX, there are [inaudible] if you have a Sun sitting in your den, or Solaris also for Suns.

But basically, for hobbyists, use probably [LYNX] as the way to go, and that's free. There are some versions of [LYNX] which cost as much as \$50 which are like on CD-ROM and they're ready to go with a lot of documentation, so sometimes... you can get it for free, but if you pay a little bit of money for it, you can get some documentation and have it a little bit easier to use.

M: [inaudible]

Kevin Savetz: Yeah, I think you can set up a partitioning so that when you boot the computer, it'll say, "okay, do you want to be UNIX or do you want to run Windows?" or whatever.

M: [inaudible]

Kevin Savetz: Oh, good question. Setting up a UNIX machine in your den... is it a Web server? Assuming you set up [LYNX] for instance, and then you have an Internet connection, you've downloaded your Web server, you've installed it and many of the major Web servers such as [inaudible] hypertext demon right under [LYNX], yes, you have a Web server.

However, do you have a full-time Internet connection — if you have a Web server, as you probably know, it needs to be on-line on the Internet 24 hours a day, so... and a 28.8 modem is not going to, even if you're logged in all the time, isn't going to cut it if you have a popular Web site. So basically, if you have 128K or ISDN or T-1 going into your living room, talk to me if you do. But basically, yes. The answer is yes. You have a Web server, but assuming you have a decent Internet connection to actually serve the Web.

M: [inaudible]

Kevin Savetz: In your Web server software. Web server software is generally called an HTTP demon or HTTPD. There are several different types of those available. You can get them for free. I've used a couple of them. One is called the CERN HTTPD and it's a nice, basic free one. Pretty easy to set up, does the job.

If you want to do commercial transactions, want to take people's credit cards and that sort of thing, the only reasonable choice that I know of today is Netscape. The Netscape commerce server is \$5,000, but then you can do all that good encryption so that you can get private information relatively secure that no one's going to be able to grab that information from you.

M: Is it fairly easy to install? What kind of installation costs?

Kevin Savetz: Netscape, actually their server is fairly easy. They have a whole installation of forms, many basic installation thing. It's pretty easy to use. Pretty easy to set up. Yeah.

M: [inaudible]

Kevin Savetz: I could get into trouble for... if I say something then somebody, somewhere, will disagree with me.

M: [inaudible]

Kevin Savetz: Honestly, I've heard great things about some Windows NT Web servers, so I mean... if all you want to do is set up a Web server and you have no vested interest in UNIX and this doesn't need to be 20 people setting up their own Web sites, if there are just one or two people in control of the thing, you can use Windows NT and avoid the whole UNIX thing altogether or you can use MacWeb and do it on a Macintosh. There is not necessarily a marriage between UNIX and Web servers, although Web servers for UNIX are very robust and can handle many people at once.

As for whether a UNIX Web server will handle more simultaneous users looking at your Web page, not necessarily. If you have a 286 running [LYNX] versus a Macintosh with 128 megabytes, the Mac will... basically, it depends on the system itself. There's no necessarily right or wrong way to set up a Web server. You had a question?

W: Say, for example, you have like a Home Page up right now and you have an Internet provider [inaudible] and so you're thinking you want to go out and buy your own server. What do you need?

Kevin Savetz: You need a host computer, whether it's UNIX or whatever. The question is, you want to set up your own server, what do you need? You need a computer, a full time Internet connection and basically, you need one that's relatively fast even if it's going to be... I wouldn't go slower than ISDN. And the cost of ISDN depends on where you are. In California, ISDN is usage-based, so if you're logged in to ISDN all the time then you're going to get a pretty hefty bill anyhow. So, you have an Internet connection, an ISDN or T-1 or whatever it is. You have an Internet service provider. You have to get your Internet connection from somewhere. And you need your Web server software that you can set up on your system. These are the four basic things that you need to set up your own Web server.

W: [inaudible]

Kevin Savetz: Can your computer do other things? Depending on the load on your Web server and what you're doing to it. You may be able to share... I mean, certainly, if you have a UNIX machine as a Web server, you can log in and send e-mail and do other things while it's serving Web. Assuming you have enough memory, you can use Microsoft Word or crunch numbers in your spreadsheet while your Web server is going on. Now, of course, hey, if you're running a program that crashes your system, then you'll probably just crash your Web server as well. But if you want to go on the cheap, you can use a computer to do multiple things.

W: Well, I mean, ballpark figure.

Kevin Savetz: Ballpark price. It really depends on your specific set-up. I would say for the first year, guessing, this is the ability to fluctuate... \$10,000.

W: [inaudible]

Kevin Savetz: A firewall would be a totally separate thing, yeah. Was there a question over here?

M: I was just going to ask you about the security issues.

Kevin Savetz: Well, yeah. It depends on your system and on what you're doing. The question is about firewalls. If you have a machine in your den or whatever, and it's only a Web server and you don't have a network at home, really you don't need a firewall because the Web... the nature of your Web server is you want people to be able to use that information and there's no connections to anything that people could hurt, so you don't really need a firewall.

Now, if you have a UNIX system that you are using as a Web server and you have your profit and loss statements for your business and a lot of other important things, then you need to have a secure system and possibly a firewall. Firewalls are very expensive, however, and there's many, many different options. You can go out on the show floor and say, "who's got a firewall" and twenty people will run up to you from different companies. You can get hardware ones and software ones. They tend to be very expensive and pretty complicated. I honestly don't know a whole lot about them, but if you are worried about people getting access to your information, then you can either put it on a separate network so people physically can't get there or you can set up a firewall.

TUTORIALS HOTJAVA, MULTIMEDIA AND THE WEB



SPEAKERS

David Levine
President, HuskyLabs
Matt Davis
HuskyLabs

David Levine: How many people here run a Web site? Great. Okay, how many here don't? Don't be embarrassed or anything. How many people do their own HTML? Great. How many people do their own graphics? How many people do their graphics well? How many people incorporate other forms of media like audio, video clips, that kind of thing? Okay, great. It's pretty sophisticated.

How many people have programmed in C or C++? Wow, okay. How many compile programs that work? Anyone familiar with PERL? Great. So this is pretty sophisticated. For about half the audience, we will try to keep things pretty simple and try to explain things clearly. If you have any questions at any point, definitely just raise your hand or shout or argue or whatever because it's a long tutorial where you don't have computers and actually get to try things yourself, so we're going to try to make sure you get as involved as possible.

There are really two aspects of this that we're going to be covering. One is using Java, which I'm mostly going to be focusing on; and one is writing your own applications, which is what Matt will be focusing on. So we'll start with more of the background and why Java is important and what it is and those kinds of things. If I get my facts wrong, it's just because I don't work for Sun — he doesn't work for Sun either — and this is all stuff we've picked up on the Net and tried out and learned ourselves and that kind of thing.

So we're very much coming at this as a Webmasters also, who recognized a new tool and decided this would be something really good for us that we're going to get into.

Basically, we've spent the last week and a half trying to get Java to run within Netscape . Very recently, Netscape licensed Java and said they were going to incorporate it into their browser. And in about three weeks of all-night sessions, the folks from Netscape and the folks from Sun got together and sort of kluged it together and made it work a little bit, and in the process broke everything. So we're in the process of moving from an alpha code to a beta code. It really wasn't a trivial upgrade, so if you're just starting now that's actually good because you'll get to start with a beta code and then they'll only have problems when they get into the production code.

What is Java ? First, we'll talk about why we consider it important and what the Web is right now and what it will be post-Java. Basically, the Web as it is right now is a bunch of files, just separate files all over the place, where you have one central language — HyperText Markup Language — kind of binding the thing together. What's on all these servers out there are various audio formats, video formats, graphic formats, some of which the browser developers have been able to incorporate actually within the browser but most of which require other applications. When you're doing your Web sites and you're doing audio, how many people use primarily .WAV files? How many use [QuickTime] files? How many use "Reel Audio"? Is there anyone out there who can tell why they made whatever decision they made in terms of what file format they decided to use?

M: [inaudible]

David Levine: So you're developing an internal Web for your organization? That's a real good example. He knows his audience and so he has picked a file format, probably the AU format I believe is what [inaudible] kind of thing. That's what the Mac sound player plays, so he's prepared all his files in that particular thing and he's relying on the fact that they have a helper application so that when they download that file it's going to launch automatically.

They've configured their *Netscape* right where it knows what helper application to look for and all that. Now, if he were at a very public site with a wide range of audience, he would have to come up with three or four different file formats to make sure everyone could listen to the same file. Even then they might have things configured right. He might have to put pointers to all these various helper applications out there around the Web and it's a big kluge because it's a pain in the neck to not know if your whole audience out there is going to be able to use the whole site that you've set up.

Another problem is download time on those files. You want it to sound good, and the better you get it to sound, the bigger the files get. Then people have started using Reel Audio [inaudible], which do better in that they compress the files a lot and stream them over the Internet. But, again, the helper applications aren't on all platforms, they're not easy to configure, so right now we have all these problems that the Web has introduced.

You have a company, Netscape, that said, we know how to fix all these problems. We'll write plug-ins for everything out there and if anyone develops their own system — like Macromedia *Director* has Lingo as a programming language, or scripting language, they have a self-playing projector thing — we'll make plug-ins, where anyone who develops a new medium can then write a plug-in. We'll incorporate the plug-in either into the *Netscape* if we think it's really important, or we'll provide an easy way for you to give us... we'll give you the code for *Netscape* as a developer in order to develop a plug-in.

Then we'll put it on the site and somehow this will be better for everybody because it will be more administration and delays and all that, but somehow people thought that would solve everything. It kind of made sense. There are companies out there like Zing and Reel Audio and you say, okay, well if Netscape is going to incorporate them, then I can produce Zing files and Reel Audio files and whatever other proprietary things I want to do and at least know I'm hitting a good chunk of the people out there.

Well, it sounded pretty good and people were real excited about the fact that their *Director* files would be able to be viewed over the Web. You'd have a nice new distribution mechanism. But it was real obvious that as soon as Sun introduced the concept of the Java programming language that there was going to be a real shift and Netscape jumped on it real quickly and now Oracle's jumped on it. The real forward-thinking companies have seen something new and this is basically what they saw. They saw something that really wasn't multimedia anymore; it was a single medium and that medium is Java.

[Arthur van Hoff], who is an engineer at Sun, wrote a browser from the ground up in the Java programming language, which is called HotJava. What Java does is, basically, allow you to write with whatever you want people to get. You still program in it, you still mark things up in HTML, you still produce files of whatever format or type you want; but with those files you send small bits of pre-compiled code along with those files and along with your Hypertext to the browser, HotJava. When it arrives you have your players there, you have all the tools you need for someone to experience what the designers and the programmers and the writers and everyone else has conceived. So all of a sudden you have infinite control over what you want people to see and how you want them to experience it.

Other tools we are seeing coming up more and more — terminal log-in programs so that someone can actually, within the browser, have a chat window and communicate with other people. Shared whiteboard space. We're going to show a lot of those things and talk to

you a little bit about how they work. Basically anything you can write in C or C++ and compile, you can write in Java and send it along.

The way I'd like to look at this, as an overview, is that now you just think about the medium; and a lot of people have been asking me, well, it is still the Web with Java if its people can invent their own protocols, they don't necessarily have to rely on HyperText Transfer Protocol. Once you get the stuff you can write any protocol you want and talk between the browser and any other servers and you have networking built in.

How many people have used CGI a lot — the common gateway interface? I figured. It's really the only way to get stuff done. You probably use it for search engines. If you have a big site with a lot of documents, you would have someone basically have a flat form, fill out the form requesting particular documents, send it to the common gateway interface, where you would have a script or a bit of compiled C code to then do the work and send the document back that would be displayed.

Pretty much everything you're doing on your site that's at all complicated, like image maps — you basically have your graphic and within the map you'll outline certain objects, drawings, whatever it is, click on that, it sends a couple packets to the server, goes into CGI, where it finds the map file and says, "okay, he clicked on that particular coordinate. Okay, that coordinate links to this file. Send back that file."

Again, all the work is done by the server. All one had to do was just record where the mouse click was and send that information. What you're going to be seeing more and more are dynamic image maps because, again, Java is able to harness the user's computer, the client's computer. When you get a new image map, a "Java-tized" image map, there is actually a little bit of code that comes along and says, when my mouse moves over this coordinate, right then and there pop up this menu; or release this audio or change this image to do this.

So before the guy even has to send something back and get a response, you have a media interactivity and that's much more gratifying for a user. We'll talk about particular applications of that.

One of the main shifts between the way the Web works now and the Web post-Java works is that you're harnessing the processing power of the host computer and you're really distributing the functionality of your programs.

So, what is Java like and how is it like PERL, how is it like C and those things? Basically, it has characteristics of all of them. It is interpretive — you need a Java interpreter. You do pre-compile it, but there's a run-time component that checks everything out on the client. And in Netscape and on HotJava you basically interpret what the language is. What they're talking about is doing a more fully compiled version that will actually get you the same speed as C and C++. That's the one between Java and C and C++, basically, because there's a run-time component, it's not quite as fast.

You've all probably heard a lot about *BlackBird*. I have no idea what it is except for what I've read and everyone says this is going to be the main competitor to Java. A real big difference I imagine... how many people have heard of *BlackBird*. and know what it is? For those who don't, it's a publishing system that Microsoft has developed which they say will provide interactivity to the Web using OLE, Object Linking and Embedding functionality.

You can link all your different applications and on your desktop to Web documents and things will come in and go right into Excel and do all these things that people have been talking about. What Sun is saying about this is that if you're using Visual Basic, basically, it's totally insecure. It would be so trivial to write a virus and send it with that.

The reason they're claiming that Java is secure is that when things are compiled they're all checked for anything that is nonstandard. It only allows you to do certain things when you compile it. If anyone has tampered with the compiler, then the run-time checker will see, okay,

this hasn't been compiled according to all these rules so it's not going to work. All the legions of C and C++ developers who think, wow, this is a way to distribute my code using *BlackBird*... I think there will be a lot of fear out there. There is also not multi-platform support. There are some of us who use UNIX and don't get to see things that other people say, oh, it's like this — like Reel Audio, I've never listened to that.

Magic Cap is another kind of vaporware-like thing. As far as I can tell, I used to live next door to the brother of the main developer and he would give me all these great releases and technical specifications and stuff, but who knows exactly what it is and how it's going to work. They talk about intelligent agents, little agents that go out into the Internet and find things and make reservations for you and all that — well, Java gives you those capabilities.

There is one project I can't really talk about, but there's a government agency who's looking at using Java as a way to really do their legwork where they don't have to... you know, they write agents in Java that'll go out and find things and collect information or whatever and come back. Java would be a very good language to do that in.

How many people have built worlds in VRML? One?

M: [inaudible]

David Levine: You've implemented them on your site? What were they like? What were they for?

M: [inaudible]

David Levine: What he said, for those who couldn't hear, is in *3-D Studio* he built a store where you can navigate through the store and find objects or fly through it. He had the light so it would change so that you would get the sense of actually being within that store.

Just to digress a little because a lot of people haven't been following VRML and what it is. It stands for Virtual Reality Markup Language and it was introduced about a year and a half ago at the CERN WorldWide Web Conference as a way... the guy who wrote it, [Mark Pesci,] was actually thinking — what he was trying to propose was a specification called the cyberspace protocol, where you would get seamless movement between Web sites. He had this idea that it would be `cs://whatever` if you were going to be using the cyberspace protocol rather than HTTP; he saw “get” and “post” as the only things you could really do. You can't provide boundaries and those kinds of things.

But people pretty much ignored the cyberspace part and looked at the markup language and said, “That's kind of neat. We can create a static space we can wander through, pick objects, click on them and then access a URL or access another world or access a medium.” There was a list running off of... that the guys at *Wired* set up, where people were discussing VRML and what to do with it and the specifications for it.

This is kind of an interesting business lesson. Mark, basically, when he first wrote the first browser called [inaudible], he did it using *Rendermorphic*. He used their rendering library for the PC, so you could navigate through this world and all that; but he hadn't really worked out the licenses or anything, so he couldn't distribute the browser for free and all that stuff.

All of a sudden Silicon Graphics was participating and said, “We'll give you “Open Inventor” status and we'll use this as a text-interpreted world so that you can do all the markup and things you want to do.” At that point Silicon Graphics sort of took it over. It basically is Open Inventor and you create these worlds and you can wander through them, but there is no activity, they're just static. I kind of lost interest at the point where it just kind of became very defined and slow-moving

But one of the problems I found [was that] there were infinite arguments over the Internet about how you would define particular objects within VRML, like how would you define a chair so that everyone wouldn't have to redefine a chair every time — if you just sort of take that chair and add your own textures, add your own cushions, all that stuff. Finally, someone asked, "Why would you want a chair in cyberspace? You don't actually have to sit down."

One thing I realized is that all that stuff from the real world, like lighting and shading and all this stuff, kind of gets in the way, in a lot of ways, of actually understanding something. What we pay attention to as programmers and developers and scholars and all those things, actually what is most important in this room in a lot of ways is the text, is the flat paper. Text in a lot of ways is virtual reality when you get into it.

I started seeing more and more VRML, even though you could create new worlds that didn't exist in this one, it had new features. What you were dealing with was space and light and things that in a sense took away from communication.

Where this is going is that with Java you have a modeler that incorporates things like PostScript, which shows font definition and all that, but also incorporates things like [inaudible] and incorporates any computer concept. You could model a world with Java and then that world can just change into a book. And it's much more. Rather than spending all the time defining all these things that 3-D graphics people are very interested in, the time with Java is spent at the very low level of actually deciding what you want all these things to do.

When Matt gets into object-oriented programming a little bit and talks about defining behaviors and methods and those kinds of things, you'll see that this is a tool for building rather than defining. We have a chair and we have a table and we've all defined what those chairs and tables are like — now we can start building our world.

What Java does is we have something that plays a sound and we have something that knows when your mouse is over a particular space and we have this object over here that knows how a particular wheel spins — those behaviors you can then start to use. You could build real worlds and real programs with these various objects that other people have already developed.

It's going to become very interesting to see who is giving away their software, who's trying to sell it, who's giving away source code. It's really going to change the software industry, and the main way that's going to happen is by taking away the API from Microsoft. Right now people develop for Windows because that's where the money is and you can't sell an application that doesn't at least have some Windows component or else you sell it for a lot of money and a few people buy it and you can do okay that way.

Just the fact that Gates controls that API got him \$50 billion or whatever he's worth now. And because people basically have to develop for his operating systems, all of a sudden there are all these applications that are run on his operating systems. Okay, so we need to buy his operating system and then, okay, will those work with all these other Microsoft products... we have to buy all those products and all that.

What you're going to see happening is when people write in Java, they're not going to care anymore if you're running a Mac or if you're running a PC or if you're running whatever. If I write an application in Java and I want it to do one particular small thing like create a shopping cart with a spreadsheet attached, so whenever someone puts something in the shopping cart and the spreadsheet is updated a little bill is there, and someone takes it out.

We want that all to run on the other person's computer, so it's actually dynamic and happening in real time. That little applet I could give away free; it's easy because I'm getting someone to actually shop in my store. Or if the service is an information service where I want someone to be actually doing math or getting stock quotes or whatever, I can just charge for

the use of that applet for a particular period of time, the use of that small application. I could charge the billing mechanism into the applet and I can build all the user information into that applet.

There is all of a sudden a tremendous amount of ability that's being given to the programmer that is not controlled by another company. I don't have to worry about the things that come up, like moving from HotJava to Netscape — I mean, those kinds of nightmares where they just break everything at once, but they apologized and said no we're not going to do it again and this is a frozen API and all that stuff.

Sun has, in terms of licensing, given away the right to use the language, to develop tools in it and you have to read through all the licensing stuff in terms of what that means in terms of selling stand-alone applications and selling them. I'm really not sure how that works. I'm not a lawyer, so, you don't have to do stuff, you just call the lawyer and say, does this make sense.

It is much more open. In a typical Sun Microsystems way they've really made it an open specification, so, for example, anyone can [inaudible] the application to whatever platform they want and really do whatever you want with it over the Internet. Imagine if you're going to develop something in Java that only runs on Windows NT and sell that as a stand-alone application.

Or like what Netscape did. They licensed Java and I'm sure paid some money to license its incorporation into a commercial product. You have to do that, but you use the language for all these other things that run over the Internet. You're not going to have to pay them anything, which is good. Probably at some point they're going to be coming out with their development kits that are going to help author things, so they're probably hoping to make money on that kind of stuff.

One thing with the Java browser and Netscape, it really supports innovation. If you write a new program and send it out, it's not going to break anything. If it runs and works, you've innovated without actually making people upgrade to support that new thing. You don't have to choose your browser based on any particular capabilities, like Netscape's ability to do all these plug-ins. I'm sure you'll see a lot more Java-enabled browsers and Java-enabled applications that act as browsers.

The other thing is, besides applets that are recognized by a browser, you can write stand-alone applications like word-processors and spreadsheet programs and anything else, actually, in Java. You have a built-in audience. As soon as people get to your site and they're running something that can read Java, then you don't have to build a user base by giving away pieces of stuff.

You'll see a lot where Zing and Reel Audio give away their clients so that people will buy their server stuff. You don't have to worry about buying a server to do Java. You just put your little applets in particular places on the server, which we'll talk about, and it gets sent along. One reason we like this is because it really is, in a lot of ways, bad for Microsoft and it's probably bad for companies I consider Microsoft-like: Silicon Graphics and [inaudible]. I hope people aren't in the room from those companies. It's okay.

Security. Basically when you compile it, it checks it to make sure you haven't done anything really weird that's going to screw other people up. When you send the application it's checked by the host computer. It's really designed for distributed environments, so you can incorporate things like remote procedure calls and weird terminals from old proprietary systems and you can probably write a Commodore emulator and run old games on it. Who knows. I'm sure you'll start seeing *Space Invaders* in Java and stuff like that.

What we're going to run through now is lots of applications and we'll talk about why they use Java, why we use Java and what it does. Some quick ones: [inaudible] front-ends. Even before Oracle officially licensed Java, we were starting to play with it because we have a

particular customer that runs Oracle databases everywhere. We wrote... basically, before, with CGI, you have these tools like *OraPERL* and *Wow*, which is *Web Work* or *Web*, that do things like go to the CGI, which turns everything like your little dialog box and buttons into SQL queries, sends those to the Oracle SQL server, finds the data, sends it back to CGI, which prepares it and then displays it on the screen in HTML 3.0 or however you defined it.

We've been doing that stuff for a while, and as soon as Java came along we knew that this would be a great way to break people of all these proprietary database interfaces developed in Visual Basic, which are a pain in the neck.

A quick particular client story. We have a very large customer that writes their own absolutely everything. They wrote their own e-mail program. They wrote their own spreadsheet program. Everything is called... it's the Coca-Cola Company and what they've done is everything is called KO something. It's KO-Anywhere like PC Anywhere; there's KO-Mail and KO-Office and there's KO-everything.

Now, they have teams and teams of programmers writing proprietary stuff who work with all their proprietary stuff. What winds up happening is that they rewrite all their CAD programs to do store-design management stuff, and it's kind of ridiculous.

When we saw it we were like, wow, this is pretty amazing. Do they actually know that by letting Web-based people in here, they're kind of undermining all these projects. What you were able to do before, like with these store management programs... And a slight sidetrack: there's a huge industry out there, I'm discovering, in how stores are laid out.

They define this amount of shelf space as a certain amount of money per year, and if Wrigley's gets that spot — there are all these incentives to have this spot — they build the casing. They're convinced there are only four different ways you're allowed to display Coca-Cola products within a store and it always has to be Coke and then Diet Coke and then Sprite and whatever. You'll always see this everywhere.

Anyway, people wanted to use this program remotely everywhere. They wanted stores to use it; they wanted their sales force to use it. So they had to distribute their own proprietary program for everyone and then every time there was any kind of update, they had to redistribute that and had to distribute files in this format or whatever.

Well, we wrote kind of a simple Web hack of that. What you would do is view things on-line as GIFs; then if you want to see this sort of CAD-type program to walk through it, you would click on it, it would come, it would recognize the MIME type and launch that particular application. They would still have to have that proprietary client application to actually view these files that'll allow you to look at and turn the store's models around and all that stuff.

Well, with Java all you need to do is send a very small application that only needs to open that particular type of file and display it and allow you to manipulate it. So all these coders with walls of Visual Basic books, if they go back to the drawing board and just port some of these to Java and learn Java, every time they have a new feature or want to do anything interesting, they just send along a new application actually to the files.

When it comes to [an] Oracle front-end, they write it in Visual Basic, define all the little widgets and how things look on the screen, but everyone gets the same thing. Whether you're an advertising agency that wants to check sales in a particular region based on an ad campaign or if you're a bottler who wants to know how many crates of Fanta Banana you've distributed to Red Lobster in Jackson, Mississippi, you still have the same interface. This way they'll be able to write very small interface programs to send to particular groups that can only see the data that they want to use. So it's a really interesting process.

Games — you're going to see millions of games. There is a great company that's here — I think they might have a booth — Dimension X, who has probably the niftiest Java site out there. It's called *VectorMan*, which is www.vectorman.com.

This is one I wish we could show you but we decided after I talked to Arthur [van Hoff] — he said they're moving everything from alpha to beta and he said just use Netscape now, don't use HotJava for your development. We decided we're only going to show you things that are beta and not alpha. Hopefully they're going to support that, but when you get to the site they've really done animations written in Java that look like the beginning of a Sega game. There are balls that fly in and sound and rotating things and lasers and all that stuff. It's really impressive.

It's one of these things — right now it's for marketing, a stand-alone Sega game. Well, why not actually keep going and write the whole game in Java. Charge people a couple of cents for usage; you know, when you're at the site you get to run through the thing. This is the kind of thing that [inaudible] will allow, where you'll be able to set up an account with Sega so you just play the game when you get to the site and they'll deduct it from some kind of bill. Who knows?

Software sales, again, charged by the usage of an application and groupware. I'm sure some of you work for organizations that have spent an awful lot of money on Lotus licenses or Novell, whatever their group stuff is called. You probably didn't need to, but it's a good steppingstone to real distributed applications, which you're going to start seeing more and more with Java.

M: [inaudible]

David Levine: That's a good question. Mostly the programs... [inaudible] can make the programs disappear. When the class comes in, I guess you would have it. What would you do with it?

M: [inaudible]

David Levine: There are stop controls and all that stuff and it recognizes when it's there and the program starts and the program stops. You can have the program die, become ineffectual.

There is the question of reverse engineering. It's probably easier to reverse-engineer a Java program than a C or C++ program at this point. So right now it's certainly not as robust a commercial application that way, but the class does come in to your computer and while it's running I imagine you could monitor the activity, you could sniff it.

M: [inaudible]

David Levine: That's the thing that's changing. That's one thing I've been actually wanting to address for us for the company that's doing this stuff. But it's really changing the way HotJava, the way Netscape actually used the classes and where they put them. There's a lot of talk about that. Do you let classes stay there? Do you let them stay in the computer? Do you automatically get rid of them because maybe there is some kind of time bomb in it? There are garbage collections that never [inaudible] reallocating and all that stuff.

I think probably the jury is still out. I think we kind of have to wait and see what the Sun developers decide and what's going on in the [UseNet] Java newsgroup. That's something we don't really know, but I'm definitely going to keep an eye on that.

M: [inaudible]

David Levine: He said there were rumors that the reason they didn't have Java in all the 2.0 beta releases and quickly sort of redid it... Sun released it for a day, and we grabbed a copy and it was great, but then it disappeared for a while — and, like, why did it go away?

Then they released a Java version of Netscape for Sun and non-Java, and there were security problems. I don't know exactly what those were. I imagine that Java is very scary to a lot of people. The idea of allowing executable programs from anywhere into your computer is scary. Who knows what it's going to be doing.

If you're worried when you register your Windows 95 about Microsoft finding out every application you're running and sending information to these other companies... Well, Microsoft at least is monitored by the Feds and all that stuff. If you go to a hacker site in Finland just to read some of their C source code to do stuff, you can imagine that they're probably checking you out and maybe... there's probably going to be a lot of that going on.

All the issues are not resolved. What probably happened is that they changed a lot between alpha and beta when they released Netscape in terms of where classes go. Just so you know — to backtrack a little bit, which Matt is going to talk about more — what classes are: Basically there are two types of files with Java. There's ".java" files, which are your source code. After you compile them you get class files, which are what you actually send to do the work.

Netscape changed really quickly how those classes are recognized by the browser; they have this weird file that recognizes particular classes. Originally they said you weren't going to be able to send your own classes, you were only going to use basic ones that they provided. There's a guy to talk to about it. His name is [Kipp Hickman] and you can just look at his page — I think it's kipp@Netscape.com. He's answered all our questions so far; he's been really helpful. He's the main engineer who incorporated Java and he could probably answer the Netscape -situated questions. That's just a resource.

The next thing I was actually going to get to is resources. The comp.lang.java newsgroup is really good. When the Netscape was released, everything was crashing. I don't know who actually reads Read Me files when you get new applications, but they have this weird file called the [Mos2.0] beta file. You have to put in your class path, which is defined in your [.chsrc] file. Who would have known?

So everything was crashing. I looked at the UseNet Java newsgroup and, of course, that's where people will be telling you what they've done, so that's a real good place to post. Don't use the mailing list that Sun set up because those have just gotten kind of out of control.

M: [inaudible]

David Levine: It's absolutely true. What you would do is you can set... they have a couple security settings which allow applets to do... like, you can get the browser — and this is kind of a hack because I don't really explain what it does — but they allow you, when you first launch the application, to allow applets to do certain things or not do certain things. So if you allow the applet to contact other hosts, then, yes, that kind of thing could actually happen. There's no question.

I run applets in unrestricted mode because we have computers that are just open... a lot of our computers are just open on the Net and we've basically decided we have to do business that way and back things up and just know that at some points we're probably going to have to do a lot of — you know, there's always a balance between security procedures, precautions and getting work done. So basically if you have computers within a sensitive area, you would proxy things at the firewall — you would proxy your job applets at the firewall.

But definitely when you first launch HotJava select the most secure, restricted applet load that will only allow applets to run on a local computer and not contact other computers. So that's basically their quick pseudo-hack. I mean, if you didn't know that and just said, "Oh, I want it to be able to do anything" — yes, you are definitely opening your network up to risks.

M: [inaudible]

David Levine: It's the same in Netscape. When you first launch Netscape there's a little dialog box.

M: [inaudible]

David Levine: Rating. Oh, that's interesting. In terms of rating content for, you mean in terms of...

M: [inaudible]

David Levine: That's interesting. I was just interested in the idea, I guess. It's a really good idea. I would suggest it to the Java group. It's a good question. Who would rate it. When you produce an applet and you send it... that actually is something that they were talking about on the Java list — that would allow you to set up certain directories and certain types of files you would be able to keep and certain you wouldn't be able to keep and all that stuff.

It is a discussion. It's just that this stuff is so new I haven't been able to track everything, but now that you mention it, people are talking about that — allowing certain things and not allowing certain things. I imagine what's going to happen is that more will be allowed universally; and home users and everyone else will kind of take their risks. The real companies out there who are worried about more security problems will hold Java off.

The reason it's not as much of an issue as it should be is because basically no one is secure right now. How many people out there let their users go to college FTP sites and download whatever they want. They see this fun stock-analysis tool and they pull it in and the corporation doesn't have procedures in place to only allow — at the routers or at the firewall — people to go to certain sites. So people are downloading crap all the time and people are launching them on their computers and there are virus problems in corporations and they're sniffing problems in corporations and snooping problems.

That's what it's all about. Right now nothing is very secure. We do a lot of security stuff that you don't read about, a lot is covered up, but there is a group of Russian hackers hanging out at a major financial firm downloading... they actually pulled about \$20 million of transferred funds over the last six months and the way they're trying to find these people is by monitoring the Russian language networking newsgroups.

There's so much going on that any language that's actually designed, in a sense, to be secure, with security in mind, which C and C++ aren't... the idea is that if the job is taken seriously as a financial tool and as a real tool for corporations to develop in, then people will build their own systems and defense systems and use systems with security in mind, to allow things and not allow things. That's really the answer.

Just to give another quick example. When we are called in to do security analysis for some of these big companies, we go in, "Oh, we just want to spot-check and make sure things are okay." They have a room totally full of modems taking up the whole local exchange — maybe it's 659 whatever with *Desk Log-In* that access all kinds of stuff around the network. And

they're saying, "We put in this Internet connection, what's going to happen to all our stuff?" And we're, like, dialing and changing their stock prices and stuff.

It's just that security is an issue, but I think Java will be a good security tool. SATAN is a real good example. People were scared of what it was going to do, but it's a great security tool. And Cops and everything else. You want to hack yourself and figure out everything that's wrong and fix it and not worry about the fact that other people have ways to get in for right now.

M: [inaudible]

David Levine: Well the applets are very simple. I'm not sure what you mean. If you send a ticker...

M: [inaudible]

David Levine: Are you speaking as a user, like the end user out in the world?

M: [inaudible]

David Levine: All it's doing when you send an applet, you define everything that applet can do and if your applet is sitting on the server, it's being requested, it's being pulled in the same way every other file is being pulled in, using HTTP. So they're requesting a sound file, an HTML file, and a class file and then it's leaving you and going there.

So it's not... you're defining what that applet can do once it's on the other end. You're not opening anything up except by giving that applet certain particular behaviors that do particular things. Now if you're letting that applet talk to your server in sort of a constant... maybe a stream or something that's sending constant data, then, like anything else, whatever port that is running on, whatever that's looking for and allowing, then connecting back to your server in a continual way, it is conceivable that someone can analyze what it's doing and send those same codes to your server.

But it's really no less secure than HTTP. I mean, if you're running a server, that either better be on the other side of a firewall than your important stuff and just being backed up and [you] say, well, if someone really screws with it, it means I just have to rebuild the server; or you're proxying everything at a firewall and the server is inside and not actually taking any direct connections. They're actually being made to the firewall, the firewall is asking the server stuff, the server is telling the firewall, the firewall is telling the end user. Those are your only two ways of being secure.

So whatever you're doing with Java on the side, if you think about it, it will probably help your security a little bit. If you don't think about it, it's not going to kill you if you're not already vulnerable.

Now, Matt actually gets to do some of the fun stuff.

M: [inaudible]

David Levine: That's an interesting question. You could do packets of something. Firewalls — there are an awful lot of different kinds. There are commercial ones and some that you're able to do a lot with, but that's something to talk to your firewall vendor about how to do it. I can't imagine that there's a commercial firewall product that wouldn't allow it or disallow it, that wouldn't make sense. But you're going to make your users real upset if you start blocking all

the class files with the firewall, but it's reasonable. If they're supposed to be in a very secure area, I would imagine that would make a lot of sense.

What we are going to do is Matt is going to run through a particular... He actually got this — just so you know with this change and the problems it caused — basically, we finally got the Netscape version of Java working with our old applets Sunday night around midnight. So we had yesterday to then try to convert them all and we got a little bit done. It's not as functional as we'd like, but Matt's going to show you a little bit about it and then I'll come back and show you a lot of sites around the Net and where to find stuff and why they did it that way. So here's Matt Davis.

Matt Davis: Another question I wanted to ask, of those of you who have done C and C++, have you actually done any object-oriented programming? How many of you have done object-oriented? Okay, I should probably kind of explain what object-oriented is. What about a show of hands of how many people have kind of a good idea what object-oriented programming is? Okay, that's most everybody.

Essentially everything in Java is object-oriented, almost everything. The only things that aren't object-oriented in Java are primitive data types like "int" for integers and short and long and that kind of thing. Those aren't object-oriented per se, but they're included in the language packages. Almost everything you do in Java, if not everything, is included in a whole package library and they're called through objects.

The whole Java construct centers itself around several different classes, and when you want to use something in that class, you have to create objects from those classes. When you write your Java application you call in... like you would use "include" in the C or C++ code, you would do the same thing with the Java applet, only you would only call the classes that you want.

What I want to talk about really quickly is just the process of what you would do, what you would want to do to get Java to work on whatever platform once all these developers get Java working on PCs and Macs and UNIX a lot, lot better.

We're at a pre-beta stage right now. We've been having tons of problems with Netscape and all that kind of thing. I'm not even 100% sure that what we got working 30 minutes ago, or an hour ago, is going to work right now just because Netscape and Java have been completely unpredictable and they've pretty much said the same things to us, the Netscape people were just like, "Well, we don't know."

What we're looking at up here, this is on the resource sheet I believe, Gamelan — that's how it's pronounced by the way, with a "j" sound — it's a musical ensemble — not "Gamelan" like the "g" sound in game. This Gamelan site is a really great resource, so when you're getting into writing your own Java or getting your programmers to write their own Java, I would definitely, definitely look at this place.

They keep updating and they have forms for people to come in and submit their own applets and applications and sites. In case you don't have it, it's www.gamelan.com.

What you see right there is an actual Java applet. The one at the bottom of the page is really cool. I can grab this thing and throw it. So this application is running on this machine right here.

What they've done, when they wrote this application they called several of the class libraries out of the Java development kit, which is the distribution of the programming language and the compiler — or it's a pre-compiler really — they called the classes that they want. They incorporate the methods that come out of these classes into their code, they call on the different behaviors of the classes in their own objects, then they bundle them all together and they send them out over the Net to us. This little program has been interpreted by Netscape.

Java is an interpreted language. It's kind of like, some of you are familiar with HyperTalk, that's the language for HyperCard on the Mac. SmallTalk, PERL is kind of the same way, it's really easy. Some of them get really ridiculous. AppleScript really bothers me sometimes. I mean, they're trying to make it really easy for you to do programming and trying to make things a little bit more like English, which sometimes works against itself.

But the point behind a lot of those pseudo-scripting languages, pseudo-programming languages like Tickle and SmallTalk and PERL and HyperTalk is that they're interpreted, they're not compiled completely. They run dynamically. And that's kind of how Java works. So on this machine, for example, we would pre-compile our classes — really what it does is it goes to the Java development kit, it gets all the classes that we asked for and it packages them up for us. Then when it gets downloaded to a site, the interpreter or the browser — which would be HotJava in alpha cases, I don't know if a beta will be out soon — and Netscape in this case further interprets the code.

They're called "byte codes." It interprets these byte codes that were created on the server machine to run an applet. It's just like you would put an applet on an HTML page, just like you would put an image on an HTML page with tags. That's how it works. It's really easy. It's becoming increasingly easier because a lot of people are writing their own applets — like animation applets, like the one at the top here. I would bet this is the animation applet that the folks over at Sun wrote. It's like this package animation thing — you can download it, you don't have to do any coding at all. All you have to know is how to write the HTML for it.

M: [inaudible]

Matt Davis: Just like any animation with frames and stuff like that. However, there are methods in Java to do native graphics. Java has a whole class library of what's called "graphic graphics." It's actual drawing; you can draw your own lines and objects and shapes. In that case, you are doing real animation where you're not using frames, you're using actual animated objects.

M: [inaudible]

Matt Davis: I don't know how complete it is really, because there isn't a whole lot of documentation for it. That's one of the biggest problems that we've run into. At the Java site, they have this Java development kit and they've got this listing of the classes and they've got these weird Hypertext lengths and they don't describe what the classes really do. They kind of do in a sentence and they kind of describe what you have to use, but it's not described very well and it's not described in length. There are a couple of resources that are on this Gamelan that are really nice.

The way that all these classes are being developed, they're kind of taking the approach of... Oh, here's the Sun Home Page. Hopefully, they have a little animation applet here at the bottom. It kind of looks like they're creating all these class libraries trying to foresee what people are going to want to use, which is how they've been developing this graphics library.

They have this whole Net library which contains URL redirection objects and that kind of thing. What we're looking at right here is the Java site that Sun has. There it is. Okay, that's working the same way as that first. (Can everyone see that? Do I need to move it to the top of the screen?)

The Java site is also a good resource for doing things. One of the things — when I was trying to learn Java, I'd get very frustrated when they'd switch right in the middle of me trying to learn it — was there are some pretty good tutorial-type places at the Java site. So that's

another place that you're going to want to look. This tutorial, this Java programmer's guide is pretty nice. That's in the Sun, the Java site. That's just java.sun.com.

They use this little trail map idea to get you through the site, kind of like you were hiking on [a trail] or something. Here's this little guy, this little Duke guy, and he's an animation, there he is. That thing is called Duke.

This is a perfect example of the kind of problems that we're having with this. We've talked to Netscape, we've talked to the people at Sun and they're just like, "Well, it's just error messages. You can't do anything about it." There's like a ton of them, so I'm going to get off this page quick.

M: [inaudible]

Matt Davis: Oh, really. You mean the show toolbar thing? I need three hands.

M: [inaudible]

Matt Davis: Well, Java is loosely based on C and C++ — a lot of people probably know that. The people at Sun kind of took C++, they took, like, the structure of C++ and they took some stuff from C; they took a lot of ideas from objective C. And what they did is they kind of modeled it after those — the previous API — and they modeled it after the library structure of those things. But who knows what's going to happen.

You're right, it is kind of weird, it's kind of scary. It's poorly documented, it's still growing. They completely changed their class structure when they went from alpha to beta. The only thing I can say is we need to wait and see, and that's what we've been saying for a lot of this stuff. It's just kind of like, well, maybe it'll work next month.

M: [inaudible]

Matt Davis: That's the whole idea with it. The kind of things that the class library in Java includes are stuff like GUI, widgets and things like that. I mean, the HotJava browser itself was written in Java, it was not written according to Windows at all.

M: [inaudible]

Matt Davis: Moving on a little bit, trying to get down into the nuts and bolts of what Java actually is and how things work, we're going to show you a little something of applets. That's Netscape *Frames*, by the way, in case you haven't seen it yet. With this Netscape a lot of these are ex-Window errors. I don't know what's going happen when they start trying to do Mac toolbox stuff. That's going to be really interesting.

Everything that we see here except for the graphic in the middle [inaudible] is all Java. This is the one that we, all day yesterday, got off of the beta. The music that we hear, we were talking before about having to download a sound machine for the Mac or AU player or whatever; we don't have to have that. Java is letting us stream that audio from a server and the Java application that's embedded on this page is playing the music.

It's coming straight through that application, which means we don't have to launch an external application. We can keep the images up on the page and use the sound to really incorporate itself into the page. I'm a musician and one of my biggest interests with the Web is trying to get music and audio really incorporated into the Web. Because right now it's not.

I mean, there are a lot of different things you can do with music and audio on the Web, but it's not nearly as incorporated into the Web as it could be, it should be, or as much as graphics are. So one thing Java is going to be able to do is what you see here. It's going to be able to really incorporate these sounds.

M: [inaudible]

Matt Davis: That's a dance suite that was performed at a recital of mine a few years ago. The thing you see in the middle is an animation like you saw before and it works the same way. The butterfly is just three frames of flapping its wings. I was thinking about this yesterday and last night that it's kind of neat that the variable... because of different things, the speed of the machine... that the performance of Netscape is letting the wings flap kind of more like a butterfly would really flap its wings.

M: [inaudible]

Matt Davis: Yes. Let me kind of explain how *Netscape* does that. That little [Mos 2.0].car file, it's kind of this weird... Netscape hasn't even explained officially what that little file is.

M: [inaudible]

Matt Davis: What the file is, it's [Mos 2.0].car, and that, hopefully, it'll be documented in whatever package of Netscape you download. But what that file does is it redirects call to classes in the Netscape browser to the interpreter on your machine and it works kind of weird. That's where a lot of these errors come from.

It's almost like it's this big hack file and it's just like Netscape said, "Well, we need to tell Netscape where to find these classes," or whatever. "We need to tell them where these classes are going to be, so we'll put in this file and it'll redirect things for you."

But you're right. It just takes these methods that it's inherited from other classes, larger classes, and plays the sound file. For example, this little audio applet that we heard that was playing uses two classes.

M: [inaudible]

Matt Davis: Yes, the very first example. This is really kind of hard to explain without a whiteboard back here or a chalkboard or an overhead projector or something. It's really good to look at the source file here; and I've commented this code kind of sparsely but a lot of the code out there is commented very, very well. A lot of the code that I've come across is, but a lot of it unfortunately is not. I think there's an example in here of poorly documented, undocumented, code. That wasn't mine, it's the last example.

With this `auto audio.java` — that's the code, the name of the source file. If you look down below these comments, it says `import java.applet.applet import java.applet.audioclip`. That does two things. It imports two classes and only two classes from the class library of the Java development kit.

I could also include a wild card in those imports, so I can import an entire library of classes if I want to. I can import all of `java.applet` and just say `java.applet.*` and get all of those classes, but I didn't need to. I only needed to use the applet class so, I just imported that one.

Same deal with the other one. I just needed the audio clip class, so I just imported that one. What that does is it allows me to use those classes in my applet, but I still have to create objects in my code to be able to use the methods and emulate the behavior of those classes.

If you look down to about midway through the page, you'll see a comment that says an object sounds of class audio clip. Right there is where I've created an object from the class audio clip. And then through here, down at the bottom of the page, you'll see where this actually gets played. Sounds.play is... play is a method within the class audio clip. I'm calling that method through the object sounds or in the object sounds, so it automatically plays it. It's really that easy. This code is barely two pages; I mean, it's really a page long.

M: [inaudible]

Matt Davis: Yes, you can. In fact, another example, if you go down below that audio clip object declaration, the one right below it is string music file. There's a data type in Java, this is really nice, too.

One thing that the Java developers really tried to do for you is make things a lot easier because they know that you as Web developers just want to get your stuff out. And a lot of the Web is encumbered with a lot of difficult things to get stuff done.

Java has incorporated a lot of simple and robust procedures to help you do that; for example, it does its own memory management. There are no pointers in Java at all. There is no pointer arithmetic at all. Java does its own memory management; it does its own garbage collection. You never have to worry about that, so you never get any loose ends in your memory allocations whatsoever. You're never bothered with it.

Another thing that Java has put in here that's kind of cool is the string; if you do Macintosh, like HyperTalk stuff, you have strings. You don't have to do an array of strings to have a string, like you do in C. In Java, you can just have a string variable and it holds a string right here; it holds the location of the AU file that we heard. So in that example I just created that variable and then in this method which is right below it, I assigned it this parameter file.

If we were to look at the source of this page... this is kind of hard to read from in the back, but this right here, here's the tag in HTML that tells the browser to request the sound applet. The first part of it is, of course, applet — that's the actual tag. Code is the name of the class that's pre-compiled from this source code. So after you write this source code you pre-compile it with the Java compiler and you put it out as a start-up class file, which is what is up here; audioauto.class actually gets downloaded.

Code base is the directory that the browser should look in at the server root for the class that it's retrieving.

M: [inaudible]

Matt Davis: Going down the applet tag there, there's a width and a height. If you're doing this, Netscape will completely just break if you don't put the width and the height there. It's a little redundant because in the applet when you write the code you do that anyway and you re-size your applet, but Netscape for some reason wants to see that.

This is the one that I really want to talk about, this param. One of the things that you can do so that your applets are portable and you can use one applet over and over again for several different applications is use parameters. That's what I'm doing here. So I tell... if we look back to the code in this INIT method, I get parameter and the parameter name is file.

If we look up here in the tag, we tell the browser that the parameter's name is file and we give it a value. The value is the absolute path of the sound file, the server route. Then you go through this code and it just runs it.

You will notice that at the very top — not the very top, a few declarations down — there's a thread declaration. That's another really, really cool, awesomely cool, aspect of Java is that it's multi-threaded, multi-threadable. A lot of things are not; most things are not unless they're explicit.

Java has threading automatically in it, and you'll notice that I didn't have to import any special classes to use thread — it's all there automatically. I create a thread so that sound file is playing in a thread. Does most everyone know what I'm talking about when I say threaded applications and multi-threaded?

It's concurrent to other threads, so it doesn't have to steal processor time. So you can have several threads running in parallel together and in parallel to other processes on your computer.

What that means is that I can have a whole page of graphics or something and I can still have my animation playing without holding up any of the other graphics that are loading, any other animations that are going on.

Everything that you see on this page is threaded. This animation is not held up. It doesn't have to wait for the sound file to play; the sound file doesn't have to wait for the animation to get loaded and to start playing. Since they're threaded, they can be multi-threaded and they can do something at the same time.

M: [inaudible]

Matt Davis: There is the animator applet that I had talked about before. We didn't use the animator applet because that's one of the things we couldn't get to work. For some reason, we can't get the animator applet to work at all, but Arthur [van Hoff] has written this animator applet that has got that kind of thing.

You can synchronize audio to frames and things like that, so depending on what frame is going in your animation, you can synchronize a specific audio file to that frame. In that sound that you're hearing, that's actually a bunch of different sounds that are combined, that's not one sound file. That's actually — if you look at these different parameters — that's a list of AU files that are... they're not [inaudible] with the frames or anything like that, but they're just synchronized with the frames. It'd be really cool if they had like [inaudible] kind of stuff, but I don't know if they do. They might. This is just a sound file playing with the Java applet.

Windows 95 can handle threading. Windows NT can handle threading. The Macintosh OS has an extension that handles threading. You have to install it. There are several Macintosh applications that are threaded. Of course, when Copeland comes out we'll all be very happy with Copeland's multi-threading and all that other fun stuff. That's why we don't see a Mac OS port of HotJava or HotJava-enabled Netscape yet because the Mac OS isn't compatible with what Java can do right now. That's too bad. Apple needs to get off their butts and get Copeland out.

M: [inaudible]

Matt Davis: Sure, sure. As I mentioned before, these classes contain methods; and one thing, if you're fairly familiar with object programming, you know that you can override methods in classes.

Now what we're doing here is we're just overriding these methods. `INIT` and `start` and `stop` are built-in methods to the applet class. That's the class we imported in the very beginning. Those happen, anyway.

What I'm doing in this code is I'm overriding those methods and putting in my own directions, so when the applet receives the `INIT`, when that behavior of the applet happens, I'm telling it to assign a string to the music file string, I'm telling it to do something with the thread here when the `run` method happens. That's part of a larger class.

If you look up at the top, I defined the class `public class audio auto extends applet` — implements `Runnable`. What that means is that it extends the applet class. This is a class that I'm creating. I'm importing the applet class from the Java development kit class library. I'm extending it; it extends, it inherits the methods from the applet class.

I'm going to use those methods and since I want to use a thread, since I want my applet to run a thread, it implements `Runnable`, which is another part of the great picture. `Runnable` is not a method, `Runnable` is a class. It implements `Runnable`, so I can override the methods in `Runnable` to use them. One of the methods in `Runnable` that I'm overriding is `run`. When you use threads, that's like the big thing — that's your main thing.

M: [inaudible]

Matt Davis: What happens there, there's a large class library that your applet automatically has. You don't have to import anything. It automatically has all these classes in it, and that's the way they've set up Java to be. Whenever you have any Java application, you automatically have access to this certain amount of classes and there is a hierarchy of those classes. There's a whole hierarchy of classes that they use.

This is really poorly documented — I really wish it wasn't like this. `Runnable` is actually not part of the applet. `Runnable` is another class. This is what I'm talking about. These different packages are what you import. In this applet package, we import this applet class. There's a good diagram of this hierarchy in this trail guide. What's it's doing is it's actually using something that it automatically already has to be able to run threads and that's what this implements `Runnable` does.

M: [inaudible]

Matt Davis: Yes, it kind of is since you're not actually explicitly inheriting `Runnable`, it is sort of like that. If I did not put "implements `Runnable`" on there, I couldn't use `Run`. `Run` is part of `Runnable`. `Run` is where everything happens with the thread. I can use `start` and `stop` because they're part of applet and I can make calls to the methods in `audio auto`.

M: [inaudible]

Matt Davis: Yes. You can capture events; yes, you can capture that event and tell it to stop. So if you look down here, this is actually a version of the code before of what's actually on here in this `run` method that I've overridden to tell the sound to play. I tell it `sounds.play`. Do that method, play the sound. The class takes care of everything for me. I can capture a mouse click.

M: [inaudible]

Matt Davis: Yes, like a mouse entering the area, you can tell it to stop.

M: [inaudible]

Matt Davis: You mean in this? It's the last example? That's something that we actually picked up from somewhere else.

M: [inaudible]

Matt Davis: You're actually downloading three. If you'll watch, what's happening there is that applet is in four different places on the page. When you move the cursor over the graphic it pulls up another graphic, so it captures that mouse inter-event.

M: [inaudible]

Matt Davis: Yes. It's not so much that it's cached, it's that it's all been downloaded, which is the beauty of Java as well. Everything gets downloaded first before it gets executed, so that stuff isn't happening over any lines right now. Netscape isn't making any calls to any page. It's already downloaded these applets. They're executing.

David Levine: [inaudible]

Matt Davis: And that's an option. You don't have to do it that way either. You don't have to stream in all your graphics files like this one does. You can just have the browser download the entire applet and all the graphics files before you ever see anything and then launch the application. Which is like the Gamelan site — that animation is that kind of thing. It doesn't load every frame as the applet gets loaded. It loads the entire applet and then executes on the page.

What I should say about these things is that the best thing is to go through and just look at people's code because, like I said, the documentation is kind of sparse. A lot of that trail map isn't even finished, they haven't finished it yet. Things are changing. You just have to go through... Question?

M: [inaudible]

Matt Davis: Well, that depends on how much you have there. It's just like having several graphics without Java on your page.

M: [inaudible]

Matt Davis: They could.

David Levine: From my experience they'll complain if you don't give them something to do as other things are coming. If you look at the Sun Microsystems page, with Java they have a lot going on, probably too much. I mean, it's really enormous, but they do have some things starting to work before other things happen, like they have the Tumbling Duke come in.

After about five minutes, if you happen to still be on the page, you get the Tumbling Duke come in. But if you've already left, then you just don't know that was going to come. So it's important to [inaudible] when you design these things. And www.dnx.com, which is the Dimension X site, they don't give source for anything, which is kind of annoying, but in showing off they do have a lot of progressive rendering-type things. Where you would have... they have a lot of different streaming animations and stuff like that.

So it's a really good thing to think about and one thing I'm really looking forward to is playing more with the streaming capabilities. The other thing is once it is there, if you convince them to wait — like if you've given them stuff to do while they're waiting — when they go back to the page, you can just go to one page and come back and it should all still be there.

What's happening here is it'll take you a little while to re-draw things, but it actually should — if you've just hot-listed everything — you should be able to go right back to it once you're done with it.

M: [inaudible]

Matt Davis: Well, our URL is www.butterfly.net and we'll have pointers to a lot of different applets that we do and everything else. Yes?

M: [inaudible]

Matt Davis: These are 2 and 3K, just the applets themselves. That's not including the graphics and sounds they have to download.

M: [inaudible]

Matt Davis: Yes. It's just like creating your own classes in C or C++. You can create a class that's not an applet and create your own class that a user could download and use. It's probably possible to create if you have a very big, something that uses a lot of different things in your class or native methods or something like that. You could have the user download this class, put it somewhere and then have another smaller applet in your browser look for that class on the user machine. That seems like something that would be possible.

M: [inaudible]

Matt Davis: Java workshop? As far as the first question was, if you could optimize Java code to use the least number of byte codes? That's not something that I've tried, so I can't say firsthand, but I haven't run across anything like that, like going through code and going through this and that.

I haven't come across anyone who talks about it or mentions it, so it could be either something in development or something that just isn't possible yet or something that just nobody does. As far as the second thing, like a Visual Basic kind of environment where you could build Java applications, I'm sure that's something that people want to do because you can create a complete GUI interface with Java. I'm sure that's something that's forthcoming.

M [inaudible]

Matt Davis: They don't live there forever. They act just like anything else that you would download with a browser. They get cached, the executable would get cached as long as you tell your browser to cache it.

M: [inaudible]

Matt Davis: You mean the source class itself?

M: [inaudible]

Matt Davis: Right now there's not a really easy way for applets to talk to each other; if you're talking about, for example, they download a version updater applet or something. Is that what you mean?

M: [inaudible]

Matt Davis: He's concerned about upward compatibility and versioning classes that people have already written and distributed, and if there's something built into Java to do that. Right now it's just not something that people are addressing. It doesn't look like Sun has really been addressing that, or any other developers.

M: [inaudible]

Matt Davis: I think once they get their own frozen API, actually frozen, they're going to start worrying about that more. I think Sun's big focus right now is to just get past pre-beta into something that's actually usable, because right now it's really iffy.

M: [inaudible]

Matt Davis: The only kind of development tools you have, you mean as far as like a...

M: [inaudible]

Matt Davis: Okay. At the Java site, which is java.sun.com, all that information is there and all the different versions of the pre-beta development kit are there in a format that you can download and unpack and use on your machine.

M: [inaudible]

Matt Davis: There are a couple of tricks. If people don't explicitly put a little link on their page... a lot of people will put a link on their page to download the source, which is really nice. One thing that we've been discovering is that a lot of people use the same directory structure.

M: [inaudible]

Matt Davis: So if you just kind of mess around with their directory tree and try to find something, [most] Web servers won't let you do that, but a lot will.

M: [inaudible]

Matt Davis: It may not be there, I don't know.

M: [inaudible]

Matt Davis: I'm not sure I understand, you mean, what they're developing. Well, the methods happen. They're embedded in classes. Classes have methods. A class has a behavior and to get that behavior it uses methods, so, in answer to your question, the methods are the most stable

right now because they may add classes. Do you see what I'm saying? Methods are included in classes.

M: [inaudible]

Matt Davis: No, you don't have to define methods. You can override methods, but you have to define what classes you're using and you have to know what methods... this is one of the things that's not documented real well is what methods and what classes are available to you.

M: [inaudible]

Matt Davis: There isn't one. There isn't a class browser, as far as I know, for Java. Not in the same way that a Think compiler would have a class browser to go through the classes and find methods. You kind of have to dig and you kind of have to go through the API documentation that Java has up at their site and just kind of look through it and try to find what you're looking for. It's not really straightforward right now, but it's there. You just have to dig for it.

M: [inaudible]

Matt Davis: Yes, that's something — like we were talking about before — that's something that you can tell your browser not to do.

M: [inaudible]

Matt Davis: Yes, that's the idea. That's the whole idea that... oh, you mean from your applet?

M: [inaudible]

Matt Davis: Well, that's going to depend on two things. That's going to depend on first of all how you have your system set up and what kind of system you're on anyway. If the applet is going to be able to write to whatever file system that it's trying to write to. That's another security issue, of course.

M: [inaudible]

Matt Davis: Yes, that's just going to be something where there's going to have to be some kind of interface with the applet or the browser or something that just says, "Ignore this, I want to write to my file system with this applet." There could be methods in the applet that just ask...

[Tape change]

Matt Davis: ...either all CGI or all Java.

M: [inaudible]

Matt Davis: Do you mean dynamic creation of your pages? Well, the way that Java works, you could use Java to write those CGIs anyway. Do you write all your CGIs in C or... ?

M: [inaudible]

Matt Davis: Java works as a programming language just as well as it works as a Web-executable content language. So, yes, you could just use Java. In fact, if you look on that trail map on the Java site, that trail map programmer's guide to Java, there's a section using native resources like C libraries and stuff like that, so if you had a C library defined with your CGI stuff in it, you could use that with Java.

M: [inaudible]

Matt Davis: Well, one of the really nice things about that is that since it's interpreted, you could use all those different APIs concurrently, if I'm understanding what you're saying right.

M: [inaudible]

Matt Davis: Okay, what's he's talking about is essentially the same thing that's happened with the Microsoft API — the same trouble that developers have gotten into now — which is having to use the Microsoft API to develop software that people can use. Because it's the biggest thing that people use as far as doing what this software developer wants people to do with their software, so they have to conform to Microsoft API.

Then we said that Java gets rid of that because it's a frozen API, it's interpreted, it's cross-platform, very easily portable. But then what he's bringing up is that it would be very easy for a company like Netscape to create their own set of classes that another developer wants to use — some really nifty set of classes — and this developer wants to use them but Netscape doesn't license them. Then you've been caught in the same trap.

M: [inaudible]

Matt Davis: Yes, they could license the interface but not the classes.

M: [inaudible]

Matt Davis: How did I create it — that sound file? Originally, it was recorded from my recital and then I actually took that sound file and dumped it onto a Mac with *Sound Edit* and then messed with it like I wanted to, got the cuts where I wanted to put them, and then onto the Sun. I had an AIFF file.

Well, I went through several different platforms to get it to AU file. I had these AIFF files and we converted them to AU files.

M: What platform do you work on?

Matt Davis: There are several.

David Levine: That's been a big issue. Right now Java natively supports 8-bit, [inaudible].

M: [inaudible]

Matt Davis: Dynamic link. Are you talking about a CGI type of thing that's currently... ?

M: [inaudible]

Matt Davis: There's actually someone at Virginia Tech who wrote a Java applet that is embedded in an HTML page, just like all these other applets are, but it talks with an Oracle database.

One of the things that I'd really emphasize on suggestion is looking through these applets that other people have written and be able to see the kinds of examples... like this fellow from Tech that does charts on-the-fly from Oracle data. This is just an example of the kind of thing you can do.

With Java, almost anything you can think of, if you can program it in another language, like C or C++, you can program it in Java, which also means that you can make it executable content in HTML. It just expands the possibilities of what you can do.

M: [inaudible]

Matt Davis: I haven't come across anything myself, but I don't see why there wouldn't be. If there's a need for something like that, somebody's going to write it. It's not something that I've run across. Someone else back there had a question?

M: [inaudible]

Matt Davis: That's a good example of what's going on in the commercial Java realm. That particular demo is drawing something from a static file that is just replaying... there's source on the server that has a list of this information in a database-type thing.

I don't know exactly what's going on on the other end, although they do have an FTP-able version that you can download and run it all locally. But those files that it's reading can be constantly changing and they'll always read the new data.

There is actually a company called Market Vision, which is taking that kind of thing and they've written what they call a network utility in Java, which basically plugs — and they use the Netscape API, the server API, I believe — and kind of plug in this dynamic database thing. So you can devise your own [Bloomberg]-type system; you know, it's getting data from different places, putting it in the right files and your Java front-end is then reading those files. And every time it goes around it's gotten the new data. That's definitely a capability and now that commercial application developers are starting to write server stuff in it, you'll be able to buy things like the Market Vision Java utility.

M: [inaudible]

David Levine: I think it's always looking.

Matt Davis: You can tell an applet to locate a URL, if that's your question. You don't have to have a downloadable file.

M: [inaudible]

Matt Davis: Not if you're pointing to a URL that's being changed.

M: [inaudible]

Matt Davis: Yes, it depends on what you're pointing to. If you said, "Point to this document on my server," instead of pointing to a URL of a document that's being changed, then...

M: [inaudible]

David Levine: What the gentleman in back is saying is that someone's looking at this page that's dynamically getting information from a particular site. If I want to actually change where it's getting its information, how would I do that if he has the thing open all the time? If there is a constant connection and you break that, if you move that file that it's looking at, all of a sudden there won't be any data. If you put new data there, in terms of can you force in a new client that does very different things? I don't know. I don't think so.

You could build that into the application that it would listen for a command that says start totally over and get rid of it. Unfortunately, because we're in this transferring process, all the really cool stuff out there is still in the alpha form. There's a lot we could show you in terms of shared whiteboards and things we've done and things other people have out there, but it's just kind of a mess right now.

M: [inaudible]

Matt Davis: Yes, there are ways of implementing native methods that you can link C libraries, C functions with Java. Yes, there are ways of doing that.

Okay, if you look at the top of that icon [in] Java, you'll notice what I said I could do before, I did in this one. I imported the entire package; the entire Java.applet package contains a class called graphics and it also contains a class called image. So I'm just creating an object from the class image that I've imported because I used a wild card to import every class in that package.

M: [inaudible]

Matt Davis: Image is the class that falls into the package Java.applet.*.

M: [inaudible]

Matt Davis: There isn't. If you want it to just... explicitly, if you were worried about that, you could just import java.applet.image if you wanted to. Actually, I'm telling you the wrong thing. It's actually in "[auk]" — [java.auk.image] is the class and you could explicitly just import that class instead of everything.

A lot of people just import everything because they do it. In a lot of cases, you can just use an explicit reference and use... like here, down on the second page of that icon thing, the icon code, about halfway down where it says painting, that's a direct call to the method in that graphics class. So you can do it like that. See what I mean?

M: [inaudible]

Matt Davis: That's what that applet tag is. Is that what you're talking about?

M: [inaudible]

David Levine: I found it. It took me a while.

Matt Davis: The width and height and code base and all that kind of stuff.

M: [inaudible]

Matt Davis: It's really sparse. It's annoying.

M: [inaudible]

Matt Davis: There's a JavaNet — whatever. That's something else you can find on that API documentation page. Any other questions?

M: [inaudible]

Matt Davis: That's something that isn't fully developed by Sun right now. It's something that they've talked about. As far as I know, I haven't seen anything implemented to applets talking through TCP, but they say that that is going to be possible, that they're going to have applets be able to talk in between each other. Is that your question?

M: [inaudible]

Matt Davis: No. It will be possible. It will be possible.

M: [inaudible]

Matt Davis: Yes, pretty much. You can't talk, as far as I know... and this is something else that I just haven't gotten into... but that's pretty much the only way to get information is through URL and, like I said before, there's a whole package of URL stuff and Net stuff.

M: [inaudible]

Matt Davis: The file I/O stuff in Java exists. I don't think it's been developed to its full potential yet. The idea that Java is not a language that's been created explicitly for executable content. Their idea is that this is another object-oriented programming language and they're going to try to put everything in this programming language that's available in other objective C or C++ or anything like that. So that's the idea, is to have it be a stand-alone programming language. So yes, that's coming.

M: [inaudible]

Matt Davis: I wouldn't trust it.

M: [inaudible]

Matt Davis: No, no. You can do stand-alone applications for Java now. Is that what you're asking? Not using a browser to run Java ?

M: [inaudible]

Matt Davis: You mean, how would you run a Java application without a browser? There's a Java interpreter included in the development kit that interprets the applications that you've written and, of course, HotJava was written in Java completely and it does the same thing. In the old alpha version, the HotJava program actually calls on the Java interpreter and then all the other classes and the distribution, so you don't have to have a browser at all.

M: [inaudible]

Matt Davis: Yes, for the most part that's correct.

M: [inaudible]

Matt Davis: Yes, it just ignores the tag.

M: [inaudible]

Matt Davis: Yes. For the platforms that support Java, that's what they do. Because stuff was getting broken. That's what they did with the Solaris version and the Sun version. They have both a Java-enabled version and then a non-Java version and I expect that's what they're going to do for Mac as well.

M: [inaudible]

Matt Davis: I haven't done anything like that, no. Applets in HTML work fine.

M: [inaudible]

Matt Davis: No, I haven't worked with any.

M: [inaudible]

Matt Davis: Yes. There's not an .alt tag, but if you put something within the applet tag that's not part of the actual applet tag that does Java stuff, if you put something else in there like an image tag or something like that, that will show up instead if it doesn't have Java.

David Levine: Actually, a really good example of that is the spinning earth. When you get around to looking at it — I don't have the URL here, they have — if you're in a non-Java, it just shows the first GIF, it's image.source.earth1.gif. If you do have Java, it goes through the whole succession of images. That's the only thing that people complained about a lot in the alpha version before they set the applet-data type definition.

We do have to wrap up. There is contact information. Send us e-mails, show us what you're doing. We'll look at it if we can offer advice on fixing anything or whatever. I'm sure very quickly a lot of you will be a lot farther along than we are. Thanks a lot.

TUTORIALS
PUBLISHERS AND THE INTERNET:
IS IT THREATENING, OR IS IT THE OPPORTUNITY OF A LIFETIME?



SPEAKER
Larry Chase
President, The On-line Ad Agency

[The first few minutes of this session were lost due to recording equipment failure.]

Larry Chase: ... [You get] a little bit more elaborate and higher grades of data and collection services, but what you have here is essentially a product that you can get for free, and it does raise the issue to all publishers: How much did you give away for free and how much did you charge for it and, in fact, should you charge at all? And that's one of the things we'll talk about today.

I mentioned there are other services out there that offer something similar to this [inaudible]. You really do have to ask yourself, if I can get this for free, and another service charges me, maybe another \$5.00 a month for it, is it worth it? Is it worth a subscription to something else if I can get 80% or 90% of what I want from a site that's free? Publishers are grappling with this very problem.

There are numbers in the publishing field and in other categories of business called the 80-20 rule. And in this case, 80-20 is 80% of your revenue if you're a magazine or a newspaper, changes are plus or minus a few percent, but 80% of your revenue comes from advertising, 20% of it comes from subscription for a consumer-type publication. On the Web, there is some question whether that model will live. I'm seeing a lot of research out there that is suggesting that subscription models, unless it's in a very high-interest area, like a Lexis or a Nexis, that kind of very deep-dish data, as I call it, that you really need huge databases to access, there's some question of whether you're going to pay extra for a few percentage points more of information, particularly when everybody is fighting for your attention.

You know, some of you who came in here earlier saw that we were playing with a couple of cute images. One was that of a frog and we call him "Froggie," and Froggie is a Net surfer. And Froggie goes from lilypad to lilypad. Those lilypads happen to be your Web sites. In the case of publishers, the cyber-bait that is used to pull the frog into your Web site is content. Now, if there's a lot of competition out there, it raises the bar of quality of content constantly, in order to attract the appropriate frogs onto your Web site. You don't want all frogs; you're not all things to all people. You're probably going to address a certain niche. But, you will have to probably keep increasing the value of the information in order to compete with all of those other lilypads out there in your category to get them into your Web site. And one way to compete is to offer high-value information for free. And I think that's why some of these research reports are circumspect of the subscription model, because if you start charging for a service, and then a year out or two years out, the competitive bar has been raised to the point where people are now giving away information that you're charging for, you'll probably have an upset franchise, an upset subscriber base, and a diminishing one, at that.

I strayed a little bit off this here. We're on newspapers. I do digress a lot, but I do ultimately come back.

On newspapers, I wanted to show you a couple of the things that we use at the On-line Ad Agency for reconnaissance tools. One of them is a site called Newslink. There are few sites on the Net that have what I call "junction sites," if you will. We're up here in New England, you know, if you go out to New Hampshire for some fall foliage, if there's any left, you see these big

signs with pointers, like a 20-foot pole, and you have “Junction this way, Route 36, that way.” So we have these junctions with these pointers. Specifically, in publishing, there are a few that are very, very good tools for you to know about, if you don’t know about them already, and we’ll point them out to you during the course of this lecture.

One of them is, as I say, Newshare. Basically, it’s about as best a collection of newlinks — I said Newshare; I mean Newslink, I’m sorry — it’s about as best a collection of news-related links that I’ve seen down the Net. It covers newspapers, it covers Newswire and so forth and so on. Each industry, at this point, seems to have one or two or three of these junction stations where you can go for all the information on e-zines, and we’ll show you one of those later.

For automotive, if you’re in the automotive category, there are a couple of sites that basically say “Automotive Is Us.” You want to know about automotive or what cars are on the Net or who is selling used cars or where I can get tires for a 1955 Buick or whatever, you know, these communities, if you will. In this particular case it’s a business community. One of those communities is Newslink and it happens to be updated pretty often and we find ourselves visiting it with fair frequency.

The next one I’d like to go to is *The Wall Street Journal*, and what I’d like to point out about *The Wall Street Journal* is I think what they’re doing right here is they’re cross-promoting or cross-merchandising with the print edition of *The Wall Street Journal*, and that’s a very important point I want to make here.

The name of this seminar is “Publishing: Is It a Threat or Is It An Opportunity of a Lifetime?” It’s really both. *The Wall Street Journal*, I think, realizes it and they’re playing around with a couple of different models, as is the *New York Times* and other large newspaper concerns. The one thing that they have found is what I call — in the marketing and advertising trade there are tune-in ads. So, you’re reading *The Wall Street Journal* — I saw a gentleman here reading the *Journal* earlier — and then you suddenly see a whole page of URLs, places to go on the Net. This is not too dissimilar to listening to the radio that tells you to watch *60 Minutes* on Sunday night. Then you watch “60 Minutes” on Sunday night and they tell you to listen to all-news radio. It’s the same sort of thing.

It’s a very healthy mix that when you’re in print — print seems to be a fantastic promotional tool, not just for any publishing site, but for any site on the Web, whether it’s in an advertisement or if it’s in an editorial — we can track our Web logs any time that we get mentioned or run some advertising, we see our Web logs just spike up, and they’ll stay there for a few days or a few weeks, depending on the intensity of the publication, and then it trails off. Then there’s some pass-along and you can watch the thing go above and beyond the typical baseline of what normally flows through the site. It’s a fun thing to track, actually.

And sometimes, you’re watching the Web log and the thing just spikes and you have no idea why, and it could be because some European publication that — we were in a Dutch publication recently and suddenly, we had a bunch of European visitors, and just by looking at the domain names two weeks later, we could figure — we must have had some exposure that we didn’t know about over there.

So, *The Wall Street Journal* does a pretty nice job of cross- merchandising back and forth. What I think — this is my personal point of view, and anyone who comes along and says that there are hard-and-fast answers to any of this or that what’s true today will most-definitely be true in six months, I wouldn’t believe — but what I believe today is *The Wall Street Journal* has the right idea in terms of pointing people from the site to the print and from the print to the site. These are good links, good ways to set up — not all hyperlinks have to be on the Net. Think of hyperlinks on T-shirts, if you will. It could be on — C-Net, which is a very popular site

on the Net now, has these billboards flying by on 42nd Street in Manhattan now. I look at those as hyperlinks or, as I say, tune-in ads.

Publishers, because they already have a franchise, they already have people built in, they have an audience, can tell that audience places to go and things to do. And if it's a trade book or a trade magazine or a community magazine or whatever, chances are the people who read you are going to want to know all about that. Because, in my opinion, the Web is very vertical place. It's very tribal, and the better you are at identifying the tribe that you're catering to, meeting the needs of that tribe and telling the tribe that you have their needs met at the site and to come and visit it — that complete loop — and the better you are at organizing that loop, the better off you'll be in the long term in getting advertising support for a Web site that again, in my opinion, will probably wind up being mostly there as a vehicle, where advertising is your revenue base.

San Jose Mercury News, let's go there. Now, the *San Jose Merc* is one of those places — we tend to visit it quite often. We're in the business of covering the Internet — we cover the waterfront, so to speak — and the *San Jose Merc* is a place that we go to quite often. Now, when we go in here — now, they have a subscription; they do an interesting tie-in with — if you are a subscriber to their print edition, they only charge you a dollar a month as a value-add for the on-line version, and of course, the print edition is more expensive. If you're not a print — you know, if you don't live in the Valley and you don't subscribe but you want to subscribe on-line, I think it's like \$4.95, and then, what you're allowed to do here is you look through the headlines and you get little abstracts, and then if you want to see the deeper story, then you click on it and you give them your password and you can go inside there. A good model.

It would probably help, I think — I notice that most of their advertising falls at the bottom of the page. Now, I come from a marketing background. If I'm putting up a banner, I want to know that a banner is going to be seen first thing out. So, when somebody hits the site and they say, "Well, we get so many impressions a day," well, that may be so. But the whole page loads and we know that they saw the top part of the screen, but if you have to scroll around to get to the advertising, we're not exactly sure that they did scroll down. We have no way of knowing that.

The advertisers that I typically deal with, they want to see themselves right at the top of the page, so that they're sure when there's a hit on that page, that somebody saw that ad. And usually — and I'll get into this further — do more than just see an ad; they want to see a lot more than an ad, in my opinion. But, if you take a magazine — I'll use my cue cards here for a second — you have the front page of a magazine and then you open it up, the next page is what we call "first cover" in the advertising business. An advertiser pays premium dollar for that. And then "second cover" is here, and then on the back cover, on the back of the book, because of the nature of the print vehicle, an advertiser pays a lot for that.

What I think would be more successful for an advertising-supported publishing site is that the advertising is brought up higher on the Home Page, so that you have a banner and then you have, perhaps, some advertising, then you have a content bar with buttons in it, and then you have some more advertising, more content. Just like you do in a print magazine — you have content all juxtapositioned, from advertising to content.

Now, people will probably disagree with me on this, and as well they should. There is no one right way to do this. But I think that if it were my money, I'd want the ad at the top to make sure that people saw it. Not only would I want the ad at the top, but I would want the ad to be a little bit more contiguous to the content.

Now, what do I mean by that? Just because I read *Wired* magazine doesn't necessarily mean that I'm in the mindset to buy a Volvo that day. The demographics might be right and in the print model, that makes sense. People 25 to 34 reading *Wired* magazine, whatever it is, *Time*

magazine, okay, fine. Demographics in the old style of marketing, in the traditional style, that made sense. I don't know that that makes as much sense on the Web, and I'll give you some examples of how that will differ and how advertising and content really should work more in tandem; not necessarily to muddy the contents so that you don't know whether you're seeing an ad or you're seeing editorial. I'm not saying that. It's more of a hypothesis marketing model: if I'm reading this, I might be interested in that.

And, in fact, we have that now. If you go out and you buy *Computer Shopper*, it's safe to assume that you're going to buy a computer and, therefore, the ads within that magazine are going to be well-placed ads. In fact, I remember a time years ago when I worked in the advertising business, I looked at it demographically and I said, "Let's put a Volvo ad in there." And, Ziff Davis, who owns the magazine, said, "No, no, you can't do that." I said, "Why not?" and they said, "Because people aren't expecting to see that," and they don't — it is, as they say on the Net, off topic. And, right now, a lot of publishing sites and a lot of sites in general — I'm not singling out the publishers — I'm seeing a lot of off-topic advertising. The best example I can think of is: let's say, I'm reading a magazine and I'm in the middle of a story and it says "Turn to page 34 for the rest of the story." And I turn to page 34. Now, on the way there, there are 13 ads, and I have a choice now. I can go finish the article I was reading or I can click on each of those ads and let the ad expand out into its full glory. I tend to doubt that I'm going to click on every one of those ads and wait for them to reveal themselves to me, unless there's something in it for me, and I'll get into what that might be in a little bit.

But, while we're on the *San Jose* site, let's take a look at a source that I use called "NewsHound." NewsHound is a little bit different than publishing on the Web. NewsHound uses e-mail very effectively. And let me take this juncture, this point here, to say that I believe that the Internet is not just one medium; the Internet is a group of media. The Web happens to be one aspect of the Internet. I look at e-mail as a separate medium and it works very well in the Internet — in the Web, and we'll take a look at a Macmillan site that intertwines e-mail and Web together very nicely, because it's conscious that the Web is not everything. It isn't. And e-mail isn't everything. And the other tools of FTP and Gopher, UseNet. There are other aspects of the Internet that are very helpful to know about to a publisher or to anybody for that matter, when you're going out to promote your site, to get the traffic, to draw it in.

But NewsHound — I told you I digress. Going back to NewsHound for a second: NewsHound is a neat service. There are a few on the Web like this or on the Net. NewsHound lets me put in a profile of the kind of news I want and then it delivers it to me. For \$4.95 a month, it says, "Hey, you can have every news article in the universe, if you want it. We'll send it to you." But, that's the reason why you read magazines, is for editing. It's one of the most difficult things to do on the Internet, is to edit.

So, NewsHound and others like it — say you tell us what key words you want to know about and we'll search the Associated Press, we'll search Knight-Ritter, we'll search UPI, we'll search the PR Wire, the Business Wire, Reuters and some other places. And when we find those key words that are high up enough in the story — because you give a selectivity rating so you can have a screen and raise the bar so that — because at first, I said, "Yeah, give me a lot," so I kept the selectivity low and I got inundated with like 50 press releases a day. I couldn't deal with it, so I kept ticking the thing up. I'm up about 90 now, so I get about four really worthwhile, highly-filtered news articles a day through NewsHound. I'm actually paying NewsHound to not receive information. I pay them as much to not get things as I do to get things, which is an interesting concept.

I have a feeling that a few years from now, we're going to look back and think, "God, we did all that manually." And there are people today — you know, we're all bloodshot eyes — our eyes are bloodshot from running around the Internet trying to see everything. It's

impossible to do that. A lot of tools will come on-line, the smart agents — what are those called? — the intelligence agents, right — that will do a lot of this for us. But, some people will go, “I remember the old days when we used to take the wheel ourselves and go for a spin on the Internet.”

W: Are you interruptible?

Larry Chase: Am I interruptible? Can you hold it? Okay. Let's go to *USA Today*. Usually, in real life, I am interruptible.

M: [inaudible]

Larry Chase: Say again, sir?

M: [inaudible]

Larry Chase: This is not real life; this is the Internet. I have no life. I suspect most people in this room have no lives anymore. If you're on the Internet, you probably gave your life up when you — “Abandon all hope, ye who enter here.”

USA Today, I got my copy this morning. I assume probably just about everybody did. Now, why would I read *USA Today* over there or on the screen over here, as opposed to in my hotel room? That's a good question. I'm not sure I have an answer. *USA Today* is sort of like a headline service. I want to get a top-line read of what's going on internationally, the region that I'm traveling in, back home, sports, weather, stuff like that. They have nice graphics, but I'm trying to figure out what they're going to ask for a subscription to this. I believe they're going to ask something like \$12 or \$13 a month, and I'm not quite sure what will be accomplished. If it was a database like Lexis or Nexis or Dow-Jones or Reuters and it was a huge, historical database, and I was a lawyer and I needed to go find a precedent piece of law from 1974 or something, I'd pay good money to go and retrieve that information.

But, for top-line information, to me, the newspaper seems a little bit more appropriate for it. It's portable, I can read it on the bus over here, I can give it to him, I can cut things out; I see a URL, I can rip it out or whatever and put it in my wallet and take it home and so forth. Why would I want to search *USA Today*? I'm not exactly sure. I think it's also a little bit overpriced.

I also think this will happen, and I'll probably be proven wrong — God knows, I have been in the past — but, I think that what will happen is the subscription will filter a lot of people out immediately. Once you filter a lot of people out, then obviously less people come to your site. You have fewer hits, whatever they are. You have lower traffic. If you have lower traffic, you're going to have a harder time selling advertisers on advertising in that medium.

If I were *USA Today*, I think I would make it free and it would be a fantastic — I would have a travel center and I would go out and get American Express and Hilton Hotels or whatever, and just leverage the heck out of that. Because chances are, people who read this — and conferences, too. Usually, I see it when I'm at these conferences and probably you do, too. So, it would be a wonderful place to use as an anchor for — *USA Today* on trade shows, *USA Today* on travel tips or whatever. But, I would do it for free and use that brand name that the Net has to build large traffic and sell that traffic to the advertiser. It'll be interesting to see over the next 6 to 12 months how this model works.

Now, *San Jose Mercury News*, you notice, that was also subscription, but that was a little different. That was trade news, and for trade news, I might be apt to pay a little bit more than

that or I might be more inclined to pay something — something. Even at that, it's less than \$12.95. So, keep an eye on this. In your folders, you should have an itinerary of most of these Web sites that we're visiting, so hold onto that, if you want, and when you go home, you can keep track of these sites, because by the time you get home — if all of these people are playing their cards right, by the time you get home, all of these sites will have changed.

And that's another thing that parenthetically I'll bring up here, and that is, as I say, you can be Mobil Oil, you can be the *New York Times*, if you're on the Web, you just got into the publishing business, like it or not. And for the same reason that I wouldn't go to the newsstand to buy the same issue of *Newsweek* last week, you can't expect people, of course, to come back to see the same information that you had last week.

A lot of times we get — one of the services that we offer the agency is what we call this — what do we call it? I forgot. It's volleys of messages that go out and go, "Hear ye, Hear ye, come to this Web site" for whatever reason that happens to be, the reason they joined that Web site. A lot of times, people ask, "Will you do some messaging for us, you know, send out some of those volleys and tell people we're here again?" And I'll say, — to use a publishing term — "What's the news peg?" And they'll say, "What do you mean?" And I'll say, "Well, what has changed in the site? What is different?" "We have a sound bite of the CEO now." And I'll say, "Well, I don't honestly think that if I go out on your behalf and start propagating messages — you know, come to this Web site, there's a new sound bite of the CEO, I don't think that that's going to draw in a lot of traffic." Therefore, you have to think a little bit more like an event marketer or like a newspaper even, and say, "Well, what's going to draw the audience? What kind of headlines, what kind of information will draw this audience in?"

So that when you do send out these volleys of information to other — you know, to Yahoo or to WebCrawler or to parts of the UseNet that may specifically talk to your particular market niche, you want to have an event in mind or a piece of information, high-value content; a novelty sometimes works. You know, people like downloading screen savers or games or something. And, of course, there's always the good, old financial incentive. Come to this Web site and save \$5 on subscribing to the hard copy of the *Wall Street Journal* or what have you.

But there should be some reason, some draw. Because, again, if we go back to the lilypads, why should I come to your Web site when I can go to the Library of Congress, when I can go to the *New York Times* or the *San Jose Mercury News* or Newslink. What is the reason? You've got to think about me, the user. You have to be a user and look at your own patterns to figure out what's the draw.

I'm doing a seminar tomorrow, the first one I'll do in a tent, which is kind of interesting. My great-grandfather was a promoter, so I've never delivered in a tent before. But there's got to be some kind of attraction, some main attraction. And in the case of publishing, it's content. That's why publishers, I think, have the opportunity of a lifetime. They're sitting on a pile of content. The question is how are you going to market that pile of content; how are you going to repurpose it? You've already got it. It's sort of like airplane seats. If an airplane flies empty or half-empty, you might as well sell the seats at half-price. That's why there's standby. The same thing here. You've got news. News is like bananas; it doesn't stay around forever. Nobody eats yesterday's bananas, or something like that.

So, you might as well repurpose it and put it up on the Web. Really, it's not that expensive. The cost of it is constantly coming down, and if you can get either extra revenue for advertisers that you now don't have or probably — and more probably, I think — you will get advertisers that you have now in your existing media, your existing print vehicles, and migrate them over to the Web, and that way, I think publishers earn the cat-bird seat. Publishers more so than ad agencies, because publishers know how to deal with content; ad agencies, much less so.

Now, ad agencies are supposed to bring marketing prowess to this, and I haven't seen a lot of marketing prowess being brought to this medium from ad agencies. With publishers, they're used to dealing with content, used to serving it up, and they know what draws. So, if you add a little bit more marketing to that mix, I think you are in a very good position to grab a piece of the marketplace.

Don't try to grab everything. Some people ask, "How many people are on the Internet?" And I have two answers: "I don't know" and "I really don't care." I'm not trying to market to everybody on the Internet. If I were marketing to everybody on the Internet, I'd be doing something wrong. I need to carve out a niche or carve out, perhaps, two or three niches, and try to cross-purpose content across those two or three niches.

That's more of what it's about, making money off of little ponds of markets rather than trying to sell one thing to everybody. This is a different medium and people aren't expecting that, and that's probably why those lawyers got so roundly flamed a couple of years ago. You know, Kantor & Siegel, when they sent out — there you were in a UseNet forum reading about tropical fish and then you suddenly got "Get your green card before June 30th, Kantor & Siegel," or whatever. It was off topic. It was rude. People don't like that. They won't accept it. I'm getting junk e-mail now. I'm not a proponent of that. I look at it and as soon as I see it doesn't say my name and "Dear Larry" or "Mr. Chase" or whatever, as soon as I see it's just a broadcast piece of mail sent to a thousand other people, I kill it. There's too much information out there now. We've gone from not enough to too much. Some people say by the end of the year, there will be 500,000 Web sites; that's a lot of information.

How are you going to attract people? A, how are you going to attract them, and then B, how are you going to let them know? And that's where you have to set up a marketing plan that says, hey, this specific group, we've got content that would be of interest to you. If you're reading this UseNet group on tropical fish, Hartz Mountain has all about fish care, or download a screen saver from Hartz Mountain or learn how to breed parakeets in your spare time, whatever. But there, at least, it's on topic. It's also an example of using UseNet — like AOL has 400 or 500 areas of specific interest, UseNet has something in excess of 15,000 or 16,000 now. So, you're apt to find niche audiences.

And after all, that's what much of publishing is about, is niche marketing, particularly book publishing. You have to find niche audiences in your UseNet group. If you search hard enough, and then if it's on topic and appropriately done and you lurk and you follow the UseNet group and the threads and how people introduce themselves, and so forth, if it's appropriate, then you can put a message out there that's appropriately worded and it's not too promotional for the information and for the benefit of the readers — that is good Netiquette. Because that is information that they probably want to know about.

Let me go to something that's overtly commercial, and that is classifieds. It's another part of publishing that we haven't talked about yet. A site called "career mosaic." There are a few sites out there that deal with publishing of classified advertising. This site is produced by a gentleman named Mark Harning at Bernard Hodis Advertising.

Now, Bernard Hodis is a recruitment ad agency, and they are the largest buyers of classified space in the country, because they place all these classified ads. And what's nice about this particular thing is Mark went up about the same time I did, a couple of years ago, and at that point, he had a few companies that were looking to hire typically — most of them were in Silicon Valley — looking to hire programmers and so forth. It's gone further out than that now into other fields: public relations, marketing, graphics and so forth and so on, as the industry of the Internet is expanding rapidly. But, this is an example of commercial information, purely commercial paid information that people will go and look at, just like they do today in

the newspaper. They'll go in the back in the classifieds and look to buy or sell a used car or look for a job or look to sell a house. It's the same sort of thing.

The Internet is a very good indexing medium. I'm sure everybody in this room has heard the name *Yahoo*. It's one of the biggest indexes on the Internet. It's a wonderful way to look up jobs or mass amounts of information. On this site, you could say, "I'm looking for a job for a copywriter in the Northeast in medical," and you could see if there are any companies out there looking for a medical writer willing to pay between \$45,000 and \$60,000 dollars. Oh, there's one in New Hampshire. It's for this sort of thing that people will seek out commercial messages.

We'll go to the next one, which is the deck-direct catalog. It's a different kind of publishing model. Again, it's commercial information. Now, you get catalogs every day in the mail. I tend to throw a lot of them away, unless I'm looking for something at that particular time. We just moved offices, and I happened to get a catalog that talked about local area networks and computer equipment. By pure accident, the people who sent me that catalog got me to look through their pages. But, the Net is a self-directed place. I also went out on the Net looking for specific pieces of furniture and things for the office, because I needed that commercial information, so the Net is also, in addition to classifieds as a commercial content, catalogs also serve very well for commercial content, for a number of reasons.

Let's take, for example, let's say, there's a laptop that they're out of stock in. No more laptop. Now, in the print catalog, that's too bad, because I'm going to have a lot of people calling me on my 800-number asking for that laptop, so I just paid for an inbound WATS line, only to tell them, "I'm sorry, we're out of that laptop." If you're publishing on the Web and you run out of those laptops, you just go in there and you take it out. People stop calling, for that laptop, anyway.

The other interesting thing about this particular catalog, it was created by a company called Convergent Media Systems. And what I like about this is that it took the assembly line of a catalog and it realizes, you know, if you're going to make a catalog for the Internet, you might make one for CD-ROM as well, and then, of course, you have the print one, too. So now you've got three assembly lines. Well, the catalog here that you're looking at also appears in print and also appears in CD-ROM. Now, it's not exactly the same. The one in print, of course, has better graphics and the CD-ROM one has moving images. This one, of course, has lighter graphics so that it doesn't take all day for the graphic to come up on the Internet, if you want a 14.4 or a 28.8 line.

But the point is that you can build an architecture of a catalog, pour the information in and then just tweak it three different ways, depending on the channel, the sales channel, whether it's a magazine for CD-ROM or what have you, that allows you to collapse the assembly process down significantly. That's why I like that and why I showed it to you now.

Let's go over and talk about magazines, now that we've covered newspapers and paid-for advertising. *Money* magazine, pretty popular site. Pathfinder itself is extremely popular. In fact, I think Bruce Judson of Time-Warner is talking here at Internet World. They've had a rather successful launch with that. They've got a lot of advertisers. Again, I notice the advertising is very often at the bottom of the page. I respect the content a lot here. There are things that I like in *Fortune* magazine, if I want to go back — or in *Money* magazine, if I remember that they had an article about estate planning, but I can't remember if it was one issue or two issues ago, I can come here and I can find it pretty fast.

M: [inaudible]

Larry Chase: There's a lot of advertising. You want to go in? And I'd probably say, "No, not necessarily. Thank you. I think I'll continue reading content." I have the same constructive advice here, that I think the content needs to be a little bit more enveloped and contiguous with the advertising.

For example, if I was looking for that article about estate planning, I think it's Northwestern Life Insurance Company that actually has an on-line calculator that — a longevity calculator that will tell you about how long you'll live, which is kind of a scary thought, actually. But, if they sponsored that article, that would be a nice synergy. That would be something that if I were looking at that content, I might be interested in using that calculator, and then if I'm using that calculator, well, maybe I am interested in a life insurance policy, or maybe I realize I don't have enough, or, I'm going to die too soon. Maybe I should take out life insurance now. So, these are the synergistic kinds of juxtapositions that I think can be explored.

But when you have a place called "Marketplace" — and I've seen these a lot in different sites. We had a media buy with a very large publisher on the Internet that has a place called Marketplace, and they rotate the ad so that they can get a lot of advertisers, and they put it in rotation. So, one week we're on the Home Page, the next week we're in the traveling section, and then the week after that, we're in this thing called Marketplace. We do all this tracking, so that any of the hits, any of the traffic that's coming from that site, it comes in a certain door. And like in the movies in the old days where the guy would sit there with a clicker counting how many people would go in, we can see how successful or unsuccessful that advertising is.

Every time they put us in that area called Marketplace, the hits just fell off a cliff. When we were on the Home Page, it was fine. We'd get hundreds of people a day coming from that site, because we were sponsoring a traveling site and the sponsor happened to be Hotel Discount, so that made good synergistic sense. But, every time they put us into the Marketplace, we called it the closet, because as soon as you're in the closet, how many people are really going to ask to see more advertising, unless they're given an incentive up front, like there's a financial incentive or there's good content incentive. But just to simply click on something that says Marketplace — I mean, I do it because I want to see who's marketing on the Internet, but I'm not sure, I'm not convinced that a lot of other people are going to do that.

Now, what's also good about the site from Time-Warner here with *Money* magazine and so forth is that it's part of a larger structure called "Pathfinder," and there is that model that works very neatly where you can — just like they do with their traditional publications — you can buy *Sports Illustrated* and then buy *People* magazine and *Money* magazine, and maybe they'll give you a volume discount, and that's a good way to cross-merchandise. Or maybe they've got deals going where if you pay us full rate card on the print edition, we'll give you 30% off on the interactive edition.

Now, they're not going to share that information with me, but if you're an advertiser and they're trying to get more advertising up on the Web and they see it as possibly a way to bring you into the publication and add more value that *Newsweek* — you know, let's say it's *Time* magazine. Now, you happen to be selling computers or modems or whatever. It doesn't have to be hi-tech; it could be anything. *Newsweek* is not yet up on the Net, no. *Time* magazine will give you exposure on the Net for the same amount of money. You'll get this many more impressions. They'll be electronic impressions rather than page impressions, but that might be better for you.

So, again, it's a competitive edge that they've garnered now in their particular niche, which is pretty large, of news magazines. They're able to sell through something that they're arch-rival, *Newsweek*, in this particular case, cannot yet promise them. So, it's also a good cross-selling tactic for the publication, from a sales and marketing point of view.

Let's go to *Epicurious*. *Epicurious* is an interesting magazine that is sort of a hybrid. It has a little bit more of an attitude, because it's based on the Net and it's not a direct descendent of one magazine. So, we've taken publications from the print universe and looked at how they manifested themselves on the Internet. Now we're starting to look at things that are purely created on and for the Internet, very often, with editorial that was originally intended for print. *Epicurious* is a very nice area that offers some nice, deep content in the area of food and life enjoyment, along those lines. There's not a lot of advertising on the site yet, but you have to give them credit for putting the content up first. They're sinking a lot of money into establishing an audience and then going out and getting the advertisers.

[Tape change]

Larry Chase: ...site for a client that already has advertising. Most clients want to say how many people do you have? Are they my kind of people? When you first launch a site, you don't know how many people you have. You don't know exactly what they are, so chances are, you're going to launch and you're going to be out there for a little while without a lot of advertising support, and that's what we call an investment of time and money. And that's pretty much what we're seeing here.

There are some others — *Popular Mechanics*, again, has very nice, glitzy graphics, but not a lot of advertising. We've seen some magazines come out of the box or out of — going public, launching and they'll ask for phenomenal amounts of money. I remember one magazine asked \$10,000.00 a month, and they had the slickest media kit. It was really dazzling, and the content was really rich. I must say, it was really exactly what was right for my client at the time. And then I said, "How many people are you getting?" and they said, "We're not sure." And I said, "But you're asking me to spend \$10,000.00 of my client's money against an audience that you're not sure is there yet?" And they said, "Yes, but you'll be a charter advertiser." And I said, "Well, I think we'll wait. We'll wait till you fill that audience."

And I found myself asking exactly the same questions that an advertiser asks a traditional publisher: What are you doing to promote the magazine; how many people know about it, what's the circulation? How many people come in every week; how many people come in every month; what's your promotion budget; how are you going to drive traffic through? You may go up on the launch and you announce in *Yahoo*, you announce in *Web Crawler* and in all the other industries and so forth. How long is that good for? That's good for a couple of weeks, but what are you going to do for an encore? How are you going to get these people to come back?

And that is the acid test question: How are you going to get these people to come back? One of the things that you can do to that end is to send out e-mail reminders, which is what we do on our side. I'll show you in a minute. And it reminds people — some people actually want to be reminded to come back, because it's an outbound kind of medium, where people, surfers, viewers, readers — call them what you will — they have the driving stick; they're in control, but they may forget about you. I mean, after all, if we're going to have a half a million sites by the end of the year, there's a lot to think about.

So when they're on your site, you may want to say, would you like to be reminded when this site changes, would you like to know about it? On our site, we've noticed that 80% of the people — it defaults to no, because we don't want to breathe on anybody — but 80% of the people take that default of no and turn it into a yes. So, every time we put out a new edition of *WDFM*, a few thousand people know about it, they come back, it hits the server log, we're able to collect that data, turn around to advertisers and say we're holding our circulation or, more often than not, our circulation is increasing because we have a built-in base of people and more and more are coming in because of the promotion.

Frankly, we're taking just about all of the money from our advertisers and pouring it right back into promotion, just to build up market share. And we're probably going to do that for a good long while, but I also have other ulterior motives for publishing that publication. I never intended to really make a lot of money on it, so I don't really mind taking that revenue that I'm getting off that content and pushing it back into promotional advertising or, again, as I called it earlier, tune-in ads.

But again, I digress, so let me go back. We were on *Epicurious*. Not a lot of advertising there yet, stay tuned.

Let's go to e-zines. I mentioned Newslink earlier, which points you to just about every major news service on the Internet. By the way, just as an aside, nothing has everything. I don't care how good they are, it's impossible to know everything, so if I say that Newslink is good for having — and you're in the news business, you're with Associated Press, or what have you, or Knight-Ritter, or whatever, *New York Times*, Newslink is a good thing to have. But if you see another one that's kind of like it, I would bookmark it, because it may have a couple of areas that Newslink doesn't have, and you should collect those — pointers to pointers, as some people call them — just so you have a good comprehensive view of your particular universe.

The Web itself and the Internet at large has gotten really too big for any one person or company to get their arms around. A year ago, you really could. I remember when we went up a couple of years ago, we didn't have a lot to put up. We had a Home Page and some descriptive text, but everybody, they ran over to see it, because there wasn't much else to see. When Pizza Hut went up, Pizza Hut spent about, I think, less than \$20,000.00 to put that original site up. It sat on a Pentium box, but they got a million dollars worth of play on it. The GE catalog, 1,300 pages of plastics. You know, it made the NBC Evening News. Today, that's not going to happen. You have to do something else. Going up is no longer newsworthy.

As I say, when I went up, people came over just for the novelty of seeing what an on-line ad agency looked like. Today, every day there's another ad agency on the Web. It's not news. It's like saying, J. Walter Thompson bought a fax machine today, or something like that. Why are you telling me this? So what?

That's why I say the bar keeps getting higher and higher for value-added content, particularly in publishing, because information is that core business. You have to give something away. Notice, when we went to the *San Jose Mercury News*, they had something there, even for people who didn't pay anything, and I think that's important. The other subscription services do the same thing, for the most part. They'll give you some stuff, almost as if to say thank you for stopping by, but it's very un-Netlike to say, "Restricted, there's nothing here for you; go away." There should be something that you should offer to somebody who may or may not come by. After all, it's public relations, and if you've got the content, err on the side of giving something away — that's what I would say to you.

Let's go to C-Net. We're now going into the land of zines. What is a zine? What is an e-zine? Everybody has a different description, a different definition of this. I would say that a zine is basically an electronic version or an electronic magazine. It may not even be a version of a print magazine. Very often, it is not, in fact. C-Net is a type of zine. It happens to be a very big zine, because every week they have a half-hour hyperlink called a television show, and it airs on the Sci-Fi Channel and USA Network and some syndicated stations around the country. Everything that they talk about on the TV show is covered in more detail on the Web site. And, again, it's a great example of a cross-promotional tie-in.

So, you go to the Web site and it refers to the TV show, it even has video clips of the TV show. You watch the TV show and there are always URLs going along the bottom of the screen of where specifically on the site to go to get more information, which is one very good reason why you really do want to think about publishing on the Web. If you're buying space —

you know, newsprint is expensive, cyberspace is not. You can elaborate forever on whatever it is you want to talk about, whether it's tropical fish or science fiction or what have you. There's always more information for those who want it available on the C-Net site.

So, C-Net is a type of zine. It's sort of a hybrid TV zine, if you will. It's a good model to work from, if you have a television network in place and a video crew. They do a very interesting thing on the C-Net. They have a video camera that is fixed on the studio, and it changes; every minute there's a new picture. So when the TV show is live, you can see these sort of herky-jerky-looking pictures of John Devorak or whomever is giving a review of whatever Netscape product there is or whatever. You can actually see the show live on the Web site at one frame a minute, or something like that. I looked at it last night and, of course, the studio was empty. It was the middle of the night, but there it was. That's a form of publishing. It's not just textual information. It can be very much graphical information, as Bill Gates can tell you. He just bought the Bettman Archive, and you can bet that that'll probably be made available at some point electronically, as well.

While we're on the subject of zines, let's go to *Tripod*. *Tripod* is a lesser-known zine. It's sort of like a *Wired* or a *Word* zine. *Wired* has its magazine equivalent and its print equivalent. *Tripod*, there is no print equivalent for *Tripod*. This is it. This is aimed at 25, 30, 35-year-olds. Very popular site with the people in my office. I asked them where do you go in your spare time. They like to go here. I don't necessarily frequent this, but then again, this is a different niche audience. This is aimed at them. It has nothing to do with me. They happen to think very highly of this site, so at some point, it's not unthinkable if this becomes popular enough that this goes into print. And that's a point I wish to make here, is that the Web is a very interesting tool for test marketing.

Let's go to *WDFM*, the next one. *Web Digest for Marketers* started off as a zine. The history of this is interesting. I'll share it with you. Originally, we were going to offer it as an e-mail subscription and charge \$125.00 a year for it and, in fact, we put out press releases and advertising that said just that. And we were getting checks in and we were quite happy about that. And then we realized, you know, in about a year's time, people are going to be offering this information for free, just to garner the audience, just to get that audience share, so we don't want to be in the position of having to charge for that information, as I said earlier.

So, let's just eat the investment now, build the market share, invest in some advertising saying, okay, forget it, it's free now. We were charging \$125.00, now it's free. That worked very well. So well, in fact, that we've now syndicated it and it's in print. You can read it in *DM News* and it is soon to be in some other publications, both here and in Europe. What we learned from this — and we had no idea that this would happen; this was not in the business plan — what we learned from this is that you can test-market something on the Internet fairly inexpensively. All you have to do is write it and some pretty basic graphics. Nothing very complicated about the graphics you're looking at there. So, we found out that there was a good, solid, loyal audience that came back repeatedly for this.

And then some other magazines and newspapers started approaching us about it and started to say, "Well, how about if we syndicate it?" And we said, "All right; that sounds good." So we have various syndications. Some of them are revenue-sharing; some of them are a swap of space for content for advertising. It works all different ways, both on the Web and other sites.

That's another point I want to make here. In the coming weeks, this will not be the only site where you see *WDFM*. Very much in the same way that you see "Star Trek" on different stations in different TV markets, the same thing will apply here. I'll license this content to other people. They'll either pay me outright for it and then get their own sponsors, or we'll have a

shared revenue model or point back to each other. But the syndication model, I think, is one that you're going to see a lot of.

And, in fact, if you go to the Meckler site, you see that — I had a very good example of that with *Interactive Age* and the *New York Times*, but then they took it away, so I can't show it to you. But for a while the *New York Times Computer Daily*, you could go to the *New York Times* site or, if you were so inclined and wanted the million people a month that happens to go to the CMP Server to read *Interactive Age* or *Net Guide* or whatever, you could go to that server and you'd go, "Oh, I didn't even know the *New York Times* had a *Computer Daily*," and you could read it on that site. It doesn't really matter what site.

You don't have to be necessarily so proprietary or protective that all roads must lead to the same site. It doesn't matter much to me whether I'm getting ad revenue off this site or off of a site in Europe that's drawing an entirely different crowd or the same crowd. I'm still getting a piece of that and that's fine with me. If somebody else wants to invest in the promotion of it and so forth, it's a good deal for them because they get content at a very inexpensive cost and then they have something to sell against. I think we'll probably see a lot more syndication models on and off the Web. This is one lesson that we learned from this.

And the other thing is that it's a good test vehicle, so that if it works, you can pull it backwards into print, which is what we've done in a couple of trade magazines that are right now aimed at marketers, but pretty soon we'll be in a few other Internet-specific magazines, as well.

The other thing I wanted to point out about the site here, is that you have different — notice, the banners all come up. You don't have to scroll anywhere. The advertising is there, so USA Data, EDS and Lotus know that every time somebody hits that page, their banner is seen.

But in my mind, to be frank with you, that's not enough. Where we're going now, where people don't have much time to arbitrarily click around and wait for graphics to load, you have to give them a pretty good reason to click on that banner.

So let's say, if you click on — if you're reading *Web Digest For Marketers*, it's a fairly safe assumption that you're somewhere in the food chain of putting up a marketing site on the Web. It's a pretty good safe assumption. If that's the case, then you may be interested in what USA Data has to offer. I'll give you something for free that you would otherwise pay for if you click here, and that's why it says "free samples of how we slice and dice data." And what they chose to do here was give you market segmentation of long-distance telephone carriers. They figure, well, people that are on the Net are probably bandwidth sensitive, so there's a good reason for marketers to look at that, because marketers are always interested in research information and how to slice and carve data for their own purposes, and this might be something that they want to take a look at. It's a good reason for them to not just advertise with us.

You know, if they just dump to the Home Page, the USA Data's Home Page, you would probably lose your prospect. You go, "Uh- huh, okay. Another company that offers research data on the Web. That's very interesting. Okay, let me go back to WDFM that I was already reading." But here, they're drawing you further and further in and showing you — strutting their stuff, basically, and showing you what they can do.

We ultimately want people — and I think everybody or most everybody should basically have people come to their site as much for the content as for the advertising. And I know that might sound a little bit ludicrous, but I mean it. The advertising is going to have to be relevant. We work under a basic premise that there is commercial information that people want, and they go for it every day, and they even ask for it, as in the case of classifieds or catalogs or what have you. There is information that people actually want. If you can figure out what kind of information that they would be interested in and give it to them and give it away for free, then you probably have somebody who'll say, "I think I'm going to come back to that site; I think I

want to see what else this person can offer me in two weeks —” if you’re lucky. Or you’ll have to send them an e-mail reminder.

And in fact, people who sign our guest log, we go in and say, do you want us to remind you, and most of them, as I say, they say yes. So people come back to see not only the new content when there’s a new edition, but they also come back to see the new advertising.

In fact, we’re opening up an area that is special, that are aimed specifically at marketers, so that if you’re into marketing, these will be like, you know, get an extra 10,000 impressions if you advertise on Riddler, if you click here, that kind of incentive type of marketing. I think it’s that kind of direction that the Web will take, that value-added reason to click here. I think just have a beer banner in the middle of text, I just don’t — right now, it’s like the 1950s. You look at advertising in the 1950s and it looks rather quaint. You know, you see little Old Gold boxes dancing around the vaudeville stage. Well, that’s cute; it’s amusing, and people sat around every night and they watched that for 60-second strips at a time. But then commercials got to be 30 seconds and then 15 seconds and then 10 seconds. Now you’ve got 3-second rolling billboard tags. People in the early days would look to see what the AT&T logo looks like on-line or what Volvo looks like on-line, but they’ll only do that once or twice, I think. After that, they’re going to want to have a real good reason to click on that. Otherwise, I think you lose them. So that’s WDFM.

The other side of this is — oh, did we show that e-zine list? Okay. There’s a list, a very comprehensive list of e-zines. Just like there’s Newslink to point you to a lot of different news sources. Again, it’s pretty comprehensive, nothing is complete because as we speak, there’s probably three new e-zines going up, so maybe tomorrow they’ll be as comprehensive as they should be today. But it’s just impossible to know everything that’s going on out there.

There are other different kinds of zines that I want to talk about. Not all zines are created equal; not all of them have graphics; not all of them are even on the Web. There are a couple that I want to talk about, and it’s hard to really surf them, because they’re not on the Web, so let me just verbalize what they are. There’s one, in particular, that I like. It’s called *Net Surfer Digest*. Now, I get a lot of magazines via e-mail, but this one comes in HTML. It actually comes all scripted, so that I can open it up in Netscape and when it talks about a site review, then I go, “Oh, that’s an interesting site. I’ll click on it.” And then it goes to that site. That’s a neat trick. It’s not hi-tech, but somebody had an idea that this was do-able. With the technology that’s out here now, we can just send them — and they give you the choice of you can have it as straight text, just like your e-mail, or you can have it as hyperlinked and open it up in Netscape or in Mosaic or Warp or whatever it is that you use, MSN, and the reader will read the hypertext. If you’re not on-line, you can click on it, it’ll pick up the modem and dial you out and it’ll take you right to the site that’s being talked about. There are other zines that are purely textual. WDFM, *Telecom Digest*, there’s thousand and thousands of these. Impossible to know how many, because some of them aren’t even public.

There are zines that go out as purely textual that are very, very down in the groove. There’s a gentleman here in the audience who puts one out from the IEEE, International Engineers. Not everyone in this room is going to be interested in it. Not everyone in this room should be interested in it. That’s the nature of the Internet, that it’s going to be a niche market. His magazine goes out to about 50,000 people. Now, does he care how big the Internet is? I don’t think so. He just knows 50,000 people get this newsletter once a week — once every other week. That’s a pretty respectable population, especially when you stop to consider that the cost of distribution is nothing. That’s pretty good. That’s a fair amount of influence.

Now, the downside of that is there are no graphics, if there is in fact a downside. Some people would prefer less graphics. And it’s not particularly pretty to look at, but it is effective and there’s one thing you can say about e-mail, it’s ubiquitous. Whether you’re on Prodigy,

CompuServe, AOL, Delphi, NL-Net, wherever you happen to be around the world, chances are you're not too far from e-mail. As far as the WorldWide Web, I don't know. I hear figures from 7 to 12 million. Frankly, I don't know what to believe anymore. I don't know that they're ever going to have hard-and-fast figures on that. I just don't know that the medium will allow for it, frankly.

But saying that you have 50,000 people reading your newsletter — I'd say that's pretty respectable. Same thing with the Electronic Newsstand. Jeffrey Dearth up here in Cambridge has the Electronic Newsstand — 200,000 people visit him every day. Does Jeffrey Dearth care whether there are 30 million people on the Internet or 40 million people or 10 million people? I don't think Jeffrey cares. He doesn't have to. He knows that he gets 200,000 people a day looking at subscriptions in the Electronic Newsstand, and he sells subscriptions on there. Then he had the prescience to realize, "Wait a minute — not only can I sell subscriptions here, but people who come to look at old editions of *Internet World* or of *Marketing Tools* magazine or *American Demographics* or whatever, people who come here looking for that, maybe they should also have some advertiser support there." So, he found himself a whole new revenue stream. When he migrated his site from his Gopher site to the WorldWide Web, he found a whole new stream of ad revenue that he didn't have before, because it was graphic.

Let's see, what else do we have here? Books. Let's go to books. Let's go to the video tape. I know we have a few book publishers in the audience here. Is now a good time? Why don't we take a five-minute stretch break and then we'll do books and finish this part and we'll take some questions, and then I'll be interruptible. Thank you.

I know we have a few book publishers in the audience here —

M: [inaudible]

Larry Chase: Yeah. I mean, that's me. That's what I like.

M: [inaudible]

Larry Chase: What was on the bottom?

M: [inaudible]

Larry Chase: Oh, on WDFM?

M: [inaudible]

Larry Chase: Well, see, but that's what I'm saying. On many of the Web pages, they are at the bottom and you have to scroll down.

M: [inaudible]

Larry Chase: I can't say whether they do or they don't. All I'm saying is that you don't have a good handle on whether they see it or not, because you have no way of knowing whether they did scroll down or not. You can't track that. And as an advertiser, I want to know. You see what I'm saying? You can't tell me, this page got 200,000 impressions. All that you know is the top half of that page got 200,000 impressions. You can't tell me with any certainty that you can scroll down and everybody else saw that ad at the bottom of the page. That was my point on that.

M: [inaudible]

Larry Chase: It's a learning process. I know, because advertisers ask me these questions. They go, "Well, I have to scroll down to get my whole banner."

M: [inaudible]

Larry Chase: I haven't had one complaint about it. Exactly, exactly. If you're doing your homework right, then it's information that they're going to want anyway. You know, if it's a financial incentive, whatever, they shouldn't mind it. It should be appropriate.

Okay. Give it another minute for people to settle in and then we'll get back to publishing, already in progress.

Some very interesting questions and I'll open the room up to questions in a few minutes. Very interesting questions about sponsorship and what to offer advertisers, how to pitch advertisers your content, and also a particularly interesting question about syndication and the tension that's between the immediacy of the Net. Do you hold your content back for the print publication that wants to print it and so forth. Let me go back to books first, though. We'll finish up with books.

Book publishers are coming on the Net in droves, as you probably know. I'd like to stop by the Macmillan site and show you something there. Interesting use of e-mail there. It's the super-information library, and one thing that we like about this site is you go in and, rightfully so, I think, it shows a bunch of different areas of trade, trade books that are available, or trade books that you can find out about when Macmillan publishes them and then, indeed, you can go in.

For example, I went in the last seminar I did and I clicked off books about on-line communications and on-line marketing, and probably once every week or once every two weeks, I get what's called a "bot." It's a robot and it's a robotic piece of e-mail. It's one of the few robotic pieces of e-mail I actually read that says, as per your request, Mr. Chase, Macmillan has just published *The Ultimate Guide to Marketing on the Internet*, or whatever it is. But based on my behest, my inquiry of a few months ago, it kicks back books of interest to me.

The question that I have for book publishers is this: For an end-user, what do you expect an end-user to do with a publishing site? And I think this is something that book publishers are grappling with, whether it's Macmillan or if we go over to the Bantam-Doubleday-Dell site, which is a pretty nice site, as far as book publishing goes. You know, you can get tours of authors and book-signings around the country and so forth and so on, and maybe on occasion, you can get the first thousand words of a book.

There's a site out there called "Dial-a-Book." It offers you the first thousand words of any given text in its library, and then if you like it, then you can buy it right there. In fact, from Dial-a-Book, if you like it that much, you can buy the whole book and download it all complete; you know, round-turn fulfillment, as they say.

But here on the Bantam-Doubleday-Dell site, it's a nice site, nice graphics. I think they did a fine job with it. But an end-user — what is an end-user going to do? I mean, think about it. When you go and you buy a book, do you go to Bantam-Doubleday-Dell; do you go to McGraw-Hill; do you go to the Macmillan Bookstore? No. You go to Barnes & Noble; you go to Walden Books or Paperback Booksmith or whatever. But you don't typically go to the publisher for a given book, unless it's a trade publisher or a specialist, sci-fi publisher, or something like that, that is so specialized that only they will have what you're looking for or they are one of the few publishers that have what you're looking for. I think this is a problem for many publishers.

I think the way that they might want to solve that is to put up their retail divisions. Right now, what they have up mostly are the corporate sites. But Bantam-Doubleday-Dell has one of the largest book clubs in America. Where is it? It should be up. Book-of-the-Month Club would do very well to be up. Cross-promotions — and again, this is more of a marketing thing, but if, say, Book-of-the-Month Club is up, then maybe Bantam-Doubleday-Dell says, “We see you’re in this science fiction area here. We have a special on the new Frederick Poll book or the unfinished Asimov or something. Click here or point this way and we’ll come to the B-D-D site and we’ll give you the first thousand words free,” or something. This begins to make sense to me, because this is within the buying habits of what people do naturally.

And while I’m on buying habits, let me speak to that a little bit. I can’t tell you how many times I’ve told people not to go up on the Internet. A lot of times, people are undercapitalized or they just have the wrong idea. They go up and they put their site together and then they say, well, we did that. But it is publishing, whether you’re in the vertical field of publishing or not. You have to refresh that site constantly and you have to budget, not only for the refreshment of that content, but then you also have to budget for the promotion of that content and going out to the appropriate places on the Net — on the Web, excuse me, I need to differentiate — places on the Web, places on UseNet, set up your e-mailing lists, and so forth and so on. I liken this medium more towards direct response and sales promotion than I do towards brand advertising. And I’ve done both. I grew up in the brand advertising universe.

A gentleman before came and asked me during the break here, well, we have the right demographics for someone like American Express. Well, that’s good, but the problem out there is that probably 300,000 other sites also have the right — after all, probably most of the Web has — if you’re on the Web, it’s quite a filter already. It means you have a modem, it means you have a computer, it means you’re somewhat literate, you’re probably making some kind of income or you’re a student, which means you have probably a certain amount of educational level. A lot of predeterminations have already been made, given the fact that you’re already up and on the Web itself. Now, going to American Express, for that gentleman, he’s got to compete with then 200,000, 300,000, 400,000 other sites. It’s better for him to go to American Express with a specific marketing plan.

Now, in this particular case, he has parents and kids. Now, my reaction back was what you may want to do is sell a marketing plan into American Express and say, get a card to your kid when he goes to school. That is, again, what I call contiguous advertising. It’s closer. It sits more comfortably next to the content that he has to offer.

Someone else was talking about the *USA Today* site, if it was sponsored by Acme Grocery Stores, or whatever. Again, to me, that’s too general a thing. My sense is that in the past 5 or 10 years, advertisers are expecting more transactional advertising; they’re expecting a cause and effect. It’s not just enough to go out there and make impressions. There should be some actionable item. There should be something you do once and you have that person’s attention. Don’t let them go away. Do something with them. Ask them if it’s okay to send them e-mail for some value-add, for some upgrade. Start a relationship. As Don Pepper says in the book *One to One Future*, this is a one-to-one medium. You’re marketing one at a time. Advertising historically, for the past 50 to 100 years, has been a proposition of one to many, but no longer do we sit and watch Ed Sullivan all together — well, he’s dead, so we’re not going to watch him — but, when we did that back in the ‘50s and the ‘60s, it was a shared experience. We all saw the Beatles and we all saw Elvis and so forth and so on. That’s not happening today.

I had a disagreement with somebody a couple of years ago. He said the Web will not be the norm; it will never be the norm. And I said I think that’s just it. There’s not going to be one norm anymore. There’ll be 100,000 norms. People will just siphon off into little slivers of

markets, little slivers of communities. You may be more in touch with somebody — the editor of WDFM, the *Web Digest for Marketers* that I publish, I don't know what she looks like; I've never met her and I talk to her every day. She lives in Marin County. This is a community, if you will — the word is so overused — a virtual community. I know more about the editor of WDFM, who's 3,000 miles away, than I do about my neighbor in the next apartment over, who's a couple of yards away. I think it's more about how to market to a community of interests.

There's a company called [lville], which I just visited the other day in New York. I think they have the right idea; we'll see. The site's not up yet, but they're looking at all things parental: raising kids, single parents, so forth and so on. Is it good enough for Levi's to advertise on that site? Just to put up Levi's as a hyperlink I don't think is enough. It's, "We interrupt this content for an off-topic Home Page brought to you by your sponsor." That's not where it's at.

Just look at yourself. There is a research term called "pulse universe." You take your own pulse and you go, "Well, I wouldn't do that; I'm not about to interrupt myself to click on — I'm in the middle of reading an article. Just because it's there, am I going to click on it? I don't think so. It's not my personal nature to do that. And if it's not mine, maybe it's not other people's, either." Probably that's the case. We're alike; we're unlike, but there's certain things that you can just intuitively know without a lot of research.

This is an exciting time; this is a very young medium. It's not going to take over print. It's going to be augmentative. Things that we look at today are going to — things that I do and say today are going to look as crude and naive in two years or less. Those Old Gold boxes that I spoke of earlier, they were made 40, 50 years ago and they look pretty funky to us now. It's not going to take 40 or 50 years for what's going on now. What I'm showing here today is going to take three or four years. And, to be honest with you, a year ago, stuff I was doing a year ago, and everybody else, looks archaic already. When you see things like *HotJava* and other things that you've seen here at the show, you can see where it's going. The orders of magnitude of sophistication, it's growing out much faster than, say, television rolled out, because people had to buy televisions. Television stations had to be erected. Here, PCs cost a \$1,000. Modems cost \$100 and less. Now they cost \$90.00. The prices just keep falling. It's Gordon Moore's law that every 18 months, power doubles and cost falls in half.

And George Gilder would say that that is true also now for bandwidth. That the cost of bandwidth we'll keep halving every 18 months, if not faster. I don't know if that's true or not. It's an interesting premise, though. If it is true, that means we're going to get a lot of data over the desktop, a lot of video and a lot of other things. Not just inbound, but outbound and upstream. I mean, to be a publisher — there's a little cartoon I'll use tomorrow at the general seminar on marketing. It shows a little girl at a lemonade stand and the headline is, "How much does it cost to put a Home Page up on the Internet?" And then she has a little sign underneath that says, "Lemonade, 15 cents, Home Pages, 10 cents."

The real question is how much does it cost to put a marketing plan up on the Internet? If you have an AOL or Prodigy account, you can put up a Home Page before the end of this lecture. That's not the question anymore. It never really was the question. It was a unique oddity. The early people, the people who came on, made their mistakes, as I said earlier — they made their mistakes early on in the game, so now, I'm looking and other people are looking at people who are going, "Oh, yeah, I made that mistake a year ago and it'll be interesting to see how long it takes me to get it." And there are just little things that you can tune in to now. I tend not to project out five years or ten years. There's enough going on right now that could be done better, like bringing the advertising banners further up on the page, making them a little bit more complimentary to the content that they're sponsoring. There's no more technology that has to happen now. Now it's just wetware.

[Tape change]

Larry Chase: ...content in an appropriate manner. To me, that's where the creativity is. I grew up as a copywriter in mainstream Madison Avenue ad agencies. For years, I won awards doing TV and headlines and all this great stuff. But, that medium has been done to death. I don't think there's a new idea left in it, and a lot of the old masters will tell you they think it's — good ads are basically reincarnations of other good ads from the '60s or '40s or '70s or '80s or whatever. When you think about it, just about everything has pretty much been done in terms of creativity.

I think that the exciting part of publishing creativity, marketing creativity is in the use of the technology and twisting it and turning it. When I got into the On-line Ad Agency, when I launched it a couple of years ago, I never dreamt that I'd been in publishing. I didn't think that I would have something called *Web Digest for Marketers*. That wasn't in my business plan. But then it suddenly dawned on me: When I launched the On-line Ad Agency and people came to look at it, I went, wow, hey, this is great, a lot of acknowledgment. And then it's like, okay, now the hits fell off. Now what do I do? How else am I going to get them to come to the Agency? Content. Yeah, that's it, content. I'll put stuff up that they want to know about. And that became *WDFM*. And I thought, I'll charge them for it. I was greedy. I said, I'll charge them for it. And then I thought, no, wait a minute, someone else a year from now is going to put this up for free, so it's better just to be early and not charge them for it and build that market share.

So, a relatively small player, like myself, suddenly has a publication that, within marketing circles, is pretty well-known. And the costs were negligible. I had no bricks, no mortar, no printing press, no cost of distribution. That worked so well we went backwards into print.

Somebody else asked me here, do the print publications mind that it gets published earlier on the Web, and that's an excellent question. In the beginning, they did. They said, would you please embargo — that is the news term they used — would you please embargo that information until we publish? I said, I don't think so. I said, that's one reason why you're on the Web — immediacy. For the same reason you can take that DEC laptop out of a catalog and just stop prompting people for calling on an 800-number to tell them that you don't have the product anymore. It's the same thing with content. It's like all-news radio for various categories. You've got all-news radio for die-casting or all-news radio for electrical engineers, only it's on the Web. Although, with audio now, it can be all-news radio.

But the point is that one of the reasons you want to publish to the Web is immediacy in a trade industry. So you really do have that up-to-the-minute kind of reportage for a very highly-defined market niche. And the other reason you want to put to the Web, also, of course, is for searchable databases, as I mentioned earlier. You can go back into Lexis and Nexis and do these very deep searches, which would take you way too long, particularly if you're a lawyer on billable time going through tomes of volumes of information by hand. Forget it. So, those are two very cogent reasons to publish to the Web.

And the gentleman who asked me the question was right on target. Print people are very, very leery of having things published ahead of their time — ahead of their press time. But as I pointed out to him, for example, *WDFM* gets printed in *DM News*. A hundred thousand people read *DM News*. In fact, more people read *DM News* off-line than on-line, so once I explained that to him, it was like, yeah, okay, that's all right. Because don't forget, not everybody is on-line. A lot of people share in this experience vicariously by reading about it or maybe they're going to be on-line in six months and they want to start getting an idea of what it's going to — and then they want places to go. I've seen people actually do this; they cut out URLs. Maybe we should make it like coupons, like dotted lines around it or something like that. But, people like taking URLs off of print. I've done ads where the headline is just the URL.

Actually, the Goodyear blimp should do that. They should put a URL on the blimp above the football games. That would be kind of fun.

Just as an aside, a very interesting aside: Goodyear publishes a lot of information about tires. A fairly low-interest category, as far as things go. I don't always go into the tire section every time I go on the Net. What's new in tires today? Hey, did you hear about those new steel-belted radials? Oh, I've got to go over there. No, it's pretty low-interest — unless, of course, I'm thinking about tires because I'm thinking about a new car. Maybe Goodyear should advertise over on Dealer Net. That's a possibility.

But, right now, Goodyear has this little blimp. It goes over this game called Two-Minute Warning. It's a football game, and on the blimp — you click the blimp and there's a challenge, the Goodyear Challenge. If you win — this is something that I worked with them on with their developers — if you win — you answer these questions about tires. I don't know anything about tires. Ah, but if you go to the site and you read — we're not going to really take too much of your time with this, but you just read a couple of our Home Pages and answer this, you'll get to go for a ride in the blimp over the Super Bowl.

Now they've had some interactive touchy-feely with you or what some people call hi-tech/hi-touch. You've interacted with this company, you learned something about tires and got thrown into the sweepstakes pool and you might wind up going for a ride on the blimp because you were playing Two-Minute Warning, which is a trivia game about football. That's not a bad tie-in. So, here's Goodyear publishing information about tires. Not the biggest draw in the world, but there it is.

Now, let's take another purchase. Let's take a grudge purchase, like insurance. Northwestern Life Insurance has this — oh, no, no, no. Let's talk about ITT Hartford. They've got an estate planner. They happen to focus on estate planning and insurance for such and life insurance. If you're interested in life insurance, maybe you're thinking about your own demise and you want to see what percentage should be in bonds and what should be in cash and how old are you and how many kids and college, and so forth and so on. You put all this information in and it spits back some information. You can't retire until you're 97. Well, you need to know these things.

So, again, this is publishing. It's not static, it's not print, it's not words, but it is a form of publishing.

I talk a lot about advertising agencies and why they're not getting this. And I think I need to repurpose that a little bit and talk about publishers, too, and say this: The Pennsylvania Railroad thought it was in the train business. It didn't realize that it was in the transportation business, so it knew not to compete against General Motors or against Delta, which flew me here. The same thing is true for ad agencies and, to some degree, for publishers.

Ad agencies think that they're in the business of advertising. They're not. They're in the information business, they're in the messaging business. Publishing is the same thing. You're in the messaging business. You have it over the advertisers, because you have better messages, you've got the content. The advertisers used to have the content. Back in the 1950s, Proctor & Gamble and Lever, they used to have these soap operas, because people who watched soap operas — the old traditional kind of advertising — people who watch soap operas buy soap, hence the name soap opera. But, Proctor said, "You know what? We're good at making Tide and Oxydol, or whatever, or Lava, or whatever. We're not terribly good at managing content, so ad agency, you manage the soap operas for us." The agencies, at one point, were in the content business, and they got out of it. They used to produce those pieces of content; albeit soap operas, still, it's content, for the clients. They're not doing that anymore. They farmed all that out and with that, they farmed out their value.

So that, to a large degree, both publishers and advertisers alike will go to ad agencies and say, what value do you bring to this? If you're farming out the [inaudible] and you're farming out the technology and you're farming out this and you're farming out that, what are you bringing to the process? Publishers are in a much better position. I just think they have to come up the ramp a little bit and get a little bit more creative and little bit more of a topical view, a higher topology and realize that it is messaging or the information business and it's not just a direct — you know, we bring *Time* magazine to the Internet verbatim. You need to do a little bit more with it. You need to use the technology.

Again, the first television commercial that came out looked like illustrated radio, because that's what writers and art directors — there were no art directors in radio, were there? — that's what writers knew what to write, was radio, so they just wrote radio with visuals. The same thing is happening here again. History is repeating itself here. A lot of the stuff that — most of the stuff that we're seeing on the Net is just repurposed, rehashed stuff that has been in brochures and in previous media. There's absolutely no value-add to it.

If you go to *Spiegel Catalog* right now — I can't think of a reason why I'd go to the *Spiegel Catalog* as opposed to reading it in print. The print one, I can take it with me, I can rip out a page, I can give it to him, I can put it on a bookshelf. If I go to the version of the *Spiegel Catalog* that's on-line right now, there's not any value-add to it. Why would I order from that on-line *Spiegel Catalog*? It's not terribly easy and I'm pretty uneasy about traveling my money over the Net.

You've got to give me an incentive. It may be a financial incentive, and it probably is, because it's cheaper to sell you over the Net than it is to sell you in a store. One of my clients is 800-FLOWERS. It's a lot cheaper.

Here's the acid test question: Why should I order over the Net? Why should I order a book over the Net if I can call an 800-number? That's something I'm pretty used to. I know how to use a telephone. I don't crash. I don't get "404 Not Found" on the 800-numbers. I get other things. But, how are you going to break my habit?

And I think the answer is I'm not going to break your habit overnight. Hardest thing to do in marketing is to break somebody's habit. We're creatures of habit. It's very difficult to say, don't pick up that phone; go to your computer; boot it up; get on the Web; launch TCP/IP; come to this Web site and buy it from us there because it's cheaper for us to sell it to you there. That's not exactly an incentive for the customer to help you out. Unless, of course, you partner with that customer and you say, I'll tell you what, it's cheaper for me to sell it to you here; I'll share the savings with you. Now we've got a financial incentive, and that's why software works so well on the Web and that's why publishing; i.e., information, works so well on the Web; because it's deliverable on-line. It's very difficult to send a hammer through a floppy drive. It doesn't travel that well yet. For information, for software, for that kind of content, that is perfect for the Net.

And that's why, as I said at the beginning of the lecture, publishing is being affected earlier than other categories of commerce, because it is a deliverable, and the early adopter companies are coming on the Net and are making their mistakes earlier rather than later. If it is a foregone conclusion that you have to be there and eventually you're going to be conspicuous by your absence, well then, you might as well bite the bullet and get there sooner rather than later and start making your mistakes today.

How much time do we have left? Half an hour? Okay. Oh, I didn't finish with books. Let me finish up on books here.

So we went to Bantam-Doubleday — let's go to Sunsite. Not there? Take my word for it, Sunsite's a great site. Sunsite is at the University of North Carolina. A couple of things I want to say about Sunsite. As that e-zine junction, pointers to pointers we showed you earlier and

Newslink pointed you to news sources, Sunsite is also good. It's in your package there, so if we don't get it, you can go home and pull it up on your own screens. Sunsite is good for its virtual library and it keeps track of all the new book companies that have come up on the Net. All of the new book publishers, book retailers, anything books. The Gutenberg Project, anything that has anything to do with book publishing. It's about as close as you can get to a comprehensive overview of what is happening in book publishing.

And the other thing I want to point to, while I'm on the subject, is this very interesting use of the nonprofit sector working with the commercial sector. It's not named Sunsite by coincidence. Sun-Lenter gave them the hardware, the servers, to do this site. Sunsite is a good site for — aside from all of the free information — again, it's free — of what's going on in terms of books on the Net. It's an interesting collaboration of commercial and noncommercial interests here. The site probably wouldn't be here if it wasn't for the good auspices of Sun Microsystems. And yet, at the same time, they're served rather nicely because every time we go — notice, I called it Sunsite. That was the name that I remembered. Actually, it's not called that. It's in the URL, I think, but people then begin to recognize brands by — particularly on EDU servers, on educational servers, this is a very interesting way for academic institutions that are strapped for money — as more and more are, with federal cutbacks, and so forth — it's a very interesting way to collaborate with the private sector to put up information that you probably already have. Probably the people who put this up were 20 years old. Somebody did it maybe for a final project or a thesis or something in grad school. Who knows? But there's a lot of intellectual power that is resident in academia. Boston is a good place to talk about this — that can be unleashed with the right combination of commercial sponsorship.

Now, on this site, I don't think it's going to be appropriate for out-and-out commercial offers. It's more the equivalent of like PBS or "Masterpiece Theater" made possible in part by... This is the Web equivalent of that, and I think you'll probably wind up seeing more and more of that as times goes on and as different academic institutions get to that point.

Just as an aside: I've seen a lot of things that have commercial value out there. For example, for a client, Hotel Discount, we found the same week that he launched, Airline Discount went up on the Net — I'm sorry — Airlines on the Net. There's this student at UC Berkeley, and he just has every single airline that's on the Net. I don't know why, but it's there. And then it was featured in a magazine. He got a tremendous amount of hits and awareness right after we set up a trade link relationship.

Now, at UC Berkeley, it was okay for him to point that to Hotel Discount. That's a commercial site. For some reason, at UC Berkeley, it's okay. There were other sites that we found, other educational sites that we found. We said, these people have great content. Let's point to them and let's see if they can point back to us and, you know, sometimes we were rebuffed and said, we do not accept commercial links on this site. It's an educational site. So, it's across the board. So, it depends on the trustees; it depends on who's running the Web server. This is one of those gray areas right now that's being hashed out and I think it's just on a case-by-case basis.

But, some people actually, you know — when we go out and we do these, what we call, "first contact" — it's a Star Trek term — who else is out there who's like us that we should be talking to for our client?

And about 30% of them might be educational institutions, out of which maybe about 30% of them feel comfortable enough to set up commercial linking relationships with a commercial entity that can go back and forth. Typically, they have not accepted money. I don't think we've offered any. I think we just offer links back and forth. Although it will come up at some point: How much per link if we buy a chair at your university or something. This is going

to be a very interesting thing to watch over the next year, I think, because one of the biggest knowledge bases on the Net, of course, are the educational sites.

And some of the most interesting technology that can be harnessed in publishing, incidentally — like Crayon, which is what we started with, is at Bucknell. I was talking to one of my clients just before coming up to Boston here, and he said, “I’d like that on my site.” Approach them, see what they think. So, as soon as I get back, I’ll call them up. I’ll go, can we mirror it? What can we do here? How can we work together? It might be that they’ll have nothing to do with us. On the other hand, the student might just say, give me a job. So, we’re not exactly sure.

With the few minutes that we have left, why don’t we open up for questions, if there are any. I suspect there are after what — two and a half hours or so? Any questions — I can’t see well, because we’ve got these lights on me, so if you can just shout out what the question is, that’ll suffice.

M: [inaudible]

Larry Chase: The question is: What would happen if we put a link from our Home Page to Crayon? We did that and they thanked us. That’s perfectly legitimate. You can point to anyone.

This gets into legal and copyright [issues], and I’m no lawyer and I don’t even play one on TV, but if you publish on the Web, it doesn’t necessarily mean that people have the right to take your information. Chances are, they don’t. However, if you are out on the Web, people can point to you without your permission. It seems that that is a perfectly legitimate thing to do. There are times when we want to simply point to other reference tools on the Web and there are other times that we want to have them resident.

For example, Hotel Discount. We found out that a lot of people using Hotel Discount are Europeans. So, let’s publish a currency converter that’ll be updated daily, because Europeans, when they travel, they often have to change their currencies, so it’s updated daily. So, we could have simply pointed to that, and we do right now. While the thing is under construction, we point to the one that we’re going to mirror, but as a hook, we can’t just go out and say, come to the Hotel Discount site; there you’ll find the link where you can go to a calculator, a currency converter. We need certain things resident on the server so we can say, come to the Hotel Discount currency converter server that’s updated once a day — you can find out how many guilder there are in the franc or how many pounds to the yen, and so forth. No, I don’t think people can stop you from pointing.

Any other questions? Just shout it out.

W: I have a multi-part question.

Larry Chase: You have a multi-part question, a Hyperlink question.

W: A Hyperlink question. Everybody talks about content being so valuable and you should be able to use the technology better, but it’s very expensive to come up with original content. So, my question is: Do you use third-party content in your magazine or original content? And also, if you do use third-party content, have you seen examples of how that can be repackaged so it does make the best use of technology? I’m talking more about content than advertising.

Larry Chase: Interesting.

W: Let me add one more thing. That’s immediacy. How often —

Larry Chase: Wait. I'm going to lose the first half of the question unless I answer that. Ask it succinctly. I'm sorry. Do that again.

W: The question was third-party content versus original, what do you use? And because original content is so expensive, can you give some examples or elaborate a little bit how technology can be best used —

Larry Chase: Okay. Okay, good. New content typically is expensive. You have to pay somebody to put it together and somebody credible. That's why we buy magazines, so that we trust the credibility of the editing source. It's a resource that way.

In terms of our content, to be perfectly honest with you, we repurposed a lot of our content. For *WDFM*, it was an internal document. It started out as, basically, a competitive reconnaissance report. Who is up on the Net? What is going on with marketing on the Net? We wanted to know that and, in fact, again, being perfectly honest, we thought that if we publish this stuff, our competitors are going to come in and pick it off of us for free. And it's true and they do. We see them in the Web locks. There's not much we can do about that. That's just cost of business. But we repurposed much of what we already had and what we were already doing, in terms of going out surfing, collecting the information and synthesizing it for our clients and doing competitive reconnaissance missions.

So we already had some of it and we added and we backfilled it and then presented it as a package, and that's exactly where the syndication model comes in. Because we do know how expensive it is to create good, original content, content that draws, content that's attractive. That's why it's an attractive model to syndicate, because I can turn around to another Web site and say, I'll sell you this information at half the cost of what it would cost you to produce it. Or I can turn to a print publisher and say, I'll trade you ad space in your publication in exchange for this content. It's almost a say-yes proposition. This way, he gets to cover the WorldWide Web; he doesn't have to train somebody up the learning curve to know what they're writing about; he's got somebody well-versed — and she's extremely well-versed, the woman who writes *WDFM*, Roberta Kane. So, it's a win-win situation and that's why we think — the expense of that content is why we think syndication is going to be something that you're going to see more of.

Now, what was the other part of that question?

W: Well, about immediacy. From what you've seen on the Web, how often is immediate? Is it daily? Is it weekly? Is it [inaudible]?

Larry Chase: That's a good question. It could be every 30 seconds. You know, if you go to the Netscape fish cam, it takes a picture every 30 seconds or so. On the other hand — well, *WDFM*, we updated it bi-weekly and then the editor insisted, let's have a daily update, because there was so much going on in the time that it took us to produce even the Web version of *WDFM*, that she said — her name is Roberta Kane. I call her Hurricane. She's just a whirlwind of force and she says, I can't just sit on all of this news for two weeks waiting for you to publish. I'm going to put up a daily site and she just went and put up a daily site. So, in that particular case, daily.

I would say no matter who you are, whatever market you're serving, these days, I think it has to be at least once a month, if not twice a month. And if you're in hardcore news, hourly or up-to-the-minute, or 15-minute lag. Like, if you go to Stock Tickers, there's a lot of them on the Net now. There's just a constant run. You can put in stocks from the NASDAQ, American or New York Stock Exchange and get — you know, it's just a 15-minute delay, because real time costs them like \$20,000.00 a month or something like that, whereas 15-minute delay is

good enough for most people, unless they're actual traders. That's ongoing. That's, for all practical purposes, real-time publishing. Does that answer it?

W: Yes.

Larry Chase: Okay. Any other questions?

M: [inaudible]

Larry Chase: I like real-time audio. Has everybody here heard real-time audio? Most people. Real-time audio I liken to 1960s AM car radio — a little off frequency, but discernible, and that's fine. It's imperfect, but it's good enough to listen to a strip of music. There's a site now, I understand, on GNN, on the Global Network Navigator, that they just put up last week with Sony's sponsorship, that plays music strips, so you almost have an on-line jukebox — which is a form of publishing, after all — of music tastes. Is it perfect stereo? No. But if you want perfect stereo, buy the CD. But at least this way, you get a taste of it. You don't even have to go to the record store. You can just taste it there and if you like it, you can go to CD Now and order it on-line or go into the shopping mall and pick it up at your — do they still call them record stores, by the way? Music stores. Did that answer the question?

M: [inaudible]

Larry Chase: Oh, gizmos. Currency Calculator is a good gizmo. That relates to my travel client. I've seen banks use mortgage calculators — That's a neat gizmo. I saw Mr. Potato Head on the Net Friday. That's an interesting gizmo. I haven't figured out how to use that yet.

Again, going back to the creativity. In my mind, the creativity in publishing on the Net is taking a look at those gizmos, looking at Mr. Potato Head, and then figuring out how to make that apply. To me, that's where the creative energy lies, is in taking the technology and turning it into marketing.

TUTORIAL WINDOWS SOCKETS SPECIFICATION



SPEAKER
Michael Baldwin
President, Dart Communications

Michael Baldwin: Hello, and welcome to our Window Sockets Specification Tutorial here at Internet World. Its subtitle is, "How to Develop Infinite Aware Windows Applications" and we'll be talking over a broad spectrum and hopefully we'll catch everyone's interest, your specific interest. But during the tutorial, if you have a question, I welcome all questions from the audience to address particular issues that are of interest to you as we go along.

Down at the bottom here, is my E-mail address, along with our Web page at www.dart.com.

A little bit about myself: I developed my first Windows 2.0 TCP/IP application in 1990, using [inaudible] product, which was an Internet networking card. We commercialized the first WINSOCK TCP/IP protocol library in February of '93 and that was called TCP++ and that was even before the Windows socket specification was established and we participated in setting that specification and testing against it with our product.

My company develops and licenses the Power TCP protocol libraries for Windows and those were introduced in 1994, covering TELNET and TCP protocols. Today our company licenses libraries that support these protocols here that are available as C++ libraries that I spoke about yesterday. After this presentation, if any of you are interested in the subject matter, I can go over that a little bit as well as the DLL's, VBX's, OCX's that are front-ends that we put on those class libraries to fit them into a multiple of different development environments. So, I am very familiar with WINSOCK.

Our session goals this afternoon are first to provide an understanding of TCP and UDP communication basics and once we have an understanding of that, we can move forward to cover two upper-layer protocols, which are TELNET and FTP, that we've selected. We'll talk about the WINSOCK specification; why its important and how you can use it for TCP and UDP access and we'll probably talk about some of the limitations of it also. Then we'll talk about how you can access WINSOCK from various development environments, including Microsoft compilers, Visual Basic, Power Builder, Adelphi and other C compilers.

Before I go any further, do we have any experienced WINSOCK developers in the audience? Nobody to challenge me? Oh, don't make it too easy. . . . How many people here are managers that just want to learn about WINSOCK for purchasing decisions? Okay, how many people are developers? Okay, that helps me. We'll have something for everybody here. So, we'll split the talk up into three sections and we'll break at a place about halfway in between for a quick ten minutes.

First, we'll talk about UDP and TCP basics, TELNET and FTP; what those protocols are. Section two, we'll talk about the WINSOCK interface specification, its history, why it's important and some of the details of the specification; and in Section three we'll talk about development environments, introduction to TCP/IP protocol libraries. It's not enough that you simply understand what the WINSOCK.DLL means and what that specification is, if I don't give you, perhaps, a couple clues as to how you can access that from different development environments that you will be working or your development staff will be working in.

User Datagram Protocol. . . Transmission Control Protocol. I always forget telling something about terminal network protocol and file transfer protocol.

First of all, UDP or “User Datagram Protocol” is connectionless. That means you can send a packet from Point “A” to Point “B” and from Point “A” to Point “C” and then to “D”, so these packets can be individually addressed to an address [at] a port number. They are block-oriented. That means that the packet stands alone on its own two feet. It’s not part of the stream, to compare it to TCP. So if you send 512 bytes the user will receive 512 bytes in the Datagram packet. There is no guaranteed delivery, which means that just because you send it doesn’t mean it was received.

Typically a UDP protocol builds an acknowledgment into what goes on. So the nice things about it are these packets are individually addressed, so from one single source port, meaning that you open up a single socket, you can address to any socket or any port, so you can use a single socket for more than one purpose if so desired. Another benefit is that broadcast packets can be received by all hosts on a local network segment. That means that by addressing a UDP packet to the 255.255.255.255 address, you can reach all hosts that are listening on that port on that network.

M: [inaudible]

Michael Baldwin: Yes, you do. So you specify the port and then all users listening on that port will receive that and likewise you receive. . .

M: [inaudible]

Michael Baldwin: . . . If you will compare it to TCP, which is a connection-oriented protocol, Point “A” to Point “B”, you could only send over that connection. With UDP, because you have a single source, you can send it there, you can send to there, you can send to there, so it can be used to reach multiple hosts. And of course you receive all packets that are addressed to the port you bind to, so that’s the other side of it, so if you bind to port 25 and send out a broadcast to port 25, you’ll get it too.

M: [inaudible]

Michael Baldwin: Could you restate the question?

M: [inaudible]

Michael Baldwin: Can another entity get into the port? Bind to the port? No, only one application can bind to a port.

The port concept is [TCP/UDP’s] way to multiplex. So you multiplex by many applications [bound] to different ports, so that network traffic coming into those ports are multiplexed to the proper application.

Yes, sir?

M: [inaudible]

Michael Baldwin: By “application” I mean it could be three FTPs or, yes, by any application... any task in your system.

M: [inaudible]

Michael Baldwin: Absolutely. Many companies will use custom protocols for their own purposes. For example, most of the TCP/IP networking vendors with the stacks will use a custom protocol to send licensing information across the network, typically the user would not know about it unless they're doing. . . they've got a "sniffer" on their network. That's a typical application for a custom protocol who's licensing.

Okay, a typical UDP session. . . in order to do this you need to create a socket, that's a function call; bind it to a port address, it's a function call; set options, that's a function call; and notification choice, which is another function call. Then once you do all that, you can send and receive data according to the protocol being implemented. By that I mean, if I was implementing TFTP, which is based upon UDP, there are some rules. There are some protocol rules that I adhere to in order to make my TFTP client interoperable with a TFTP server that may reside [at the] host.

M: [inaudible]

Michael Baldwin: Okay, good question. A "socket" is a term that refers to a communication porthole, if you will, or a socket. . . they call a "socket", you can compare it to a file descriptor, under UNIX, where everything is a file descriptor. . . that was model they went after. Okay, so. . .

M: [inaudible]

Michael Baldwin: Yeah, the. . . it's the same concept, but it isn't . . . but under UNIX, they tried to make it look like a file, even though it wasn't and they called it a "file descriptor", even though it. . . wasn't one. In that paradigm, it was brought forward into the WINSOCK specification, so it's a descriptor of a dynamically-allocated communications mechanism. It's usually a number that starts at 1 or something and just starts incrementing.

M: [inaudible]

Michael Baldwin: Yes, sir.

M: [inaudible]

Michael Baldwin: You could. . well, when you bind to the sockets, only binding to the socket on the local host or if you're a multi-homed host, you could bind to two on the same port.

M: [inaudible]

Michael Baldwin: Yes, that's a local. "Bind" refers to your local machine, so you're binding the socket descriptor to an address specification for receiving or sending, because when you send a UDP socket, there'll be a source address and port in that packet when it goes across the wire. Then you close the socket.

This is about all we're going to talk about with UDP today. They'll be a little bit more later, but. . . TCP is a little more complicated, and that's where 95% of the applications will use TCP, so we won't talk a lot about UDP anymore until we get to the WINSOCK section.

M: [inaudible]

Michael Baldwin: Yes, sir, exactly.

M: [inaudible]

Michael Baldwin: You have to enable the communications on the port, before any communications can happen. It's often used for dynamic discovery, so that if you are constructing a special application on your network and you didn't want all your users to have to configure what IP address was the server, you could just broadcast a packet and then the server couldn't respond to the packet and then tell you where to make your TCP connection, for example. That technique is used as often as. . .

M: [inaudible]

Michael Baldwin: The technique for dynamic discovery on network? You can have all of your applications listening up on a UDP port, reserved. That's just for you. Let's say that you choose Port #2000 and then if you want to communicate with a server on the network, all you do is you send a little request out to Port 2000 and broadcast it.

M: [inaudible]

Michael Baldwin: As the client. You don't know where the server is, so you broadcast the UDP packet and the server responds with, "It's me". And then the IP address is there and then you make a connection to them.

M: [inaudible]

Michael Baldwin: The limit is a short, unsigned, short, so it's typically 1 through 64k.

M: [inaudible]

Michael Baldwin: Nothing at all. No, the first one will work and the second one will fail. There's a concept of reserved port maintained by the Internet or the Nick, I think. The people that worry about this type of thing, like there are reserved port numbers like 20 and 21 for FTP, TELNET for 23 and if you have an application that wants to use one, you can register your application port with the Internet authorities.

M: [inaudible]

Michael Baldwin: Yes, at the last page of my presentation, I've got a couple references. You can look in there. And there's a Web [inaudible] course there, too. The "InterNIC", it's called.

M: InterNIC?

Michael Baldwin: I'm not sure of. . . perhaps someone knows the address of that.

[inaudible response]

Michael Baldwin: Pardon. InterNIC? Internic.nic.com — could you repeat that one more time for this gentleman; he's trying to write that down.

[inaudible response]

Michael Baldwin: Yes, sir.

M: [inaudible]

Michael Baldwin: Then you make a connection back to 78? on TCP? Okay, so what he did was he broadcast his UDP request over Port 2000 and then the server said. . . responded to him and said, "Connect to me on Port 78 (or whatever)" and then he made an active TCP connection to Port 78.

M: [inaudible]

Michael Baldwin: The Transmission Control Protocol is connection-oriented as we discussed. Point "A" to Point "B" and you can't talk to anybody else over the same port, so that's how its different.

It's a stream, meaning that when I send out 10 bytes and another 10 bytes, send out another 10 bytes, we have no idea if on the receiving side, he'll get 1 byte, 1 byte or he'll get 30 bytes in a chunk. That's called a "stream" and there's no record blocking. Very important to understand that. Transmission Control Protocol is Berkeley by nature, in that when a user at a terminal emulator types a key, one ASCII character is surrounded by about 40 characters of packet information and is sent and nondeterministic when the person's going to type. And likewise with the FTP file transfer. You know, you're doing nothing then all of a sudden you're downloading a file as quickly as possible, so this is bursty communications as opposed to the telephone, which is 64k a second.

It's reliable end-to-end communications, meaning that you don't have to check for errors, because the underlying protocol checks for errors for you.

M: [inaudible]

Michael Baldwin: Yes. So when you have a TCP connection, you can assume that data is reaching the other side unless informed otherwise. But you can assume how quickly it gets there.

M: [inaudible]

Michael Baldwin: Connections? They are of two flavors: You can make an active connection, which is the typical terminal emulator that connects to a remote host and logs in or you can be a passive connection, which means the server, as it does with the TELNET demon, accepts the connection on Port 23 and has a handler process that handles the connections for the operating system.

Okay, and you can do this same thing. You can build a server on a PC platform under Windows 95 or Windows NT, just as easily. And we'll talk about that.

M: [inaudible]

Michael Baldwin: You use. . . well, you look at your application and then determine which features fit you best.

M: [inaudible]

Michael Baldwin: Yes, the best example was the gentleman in the back doing dynamic discovery. That's the only. . . UDP is the only way you can do dynamic discovery to broadcast a request across a network. Okay, and the best example of using TCP is a TELNET connection, where you want the data stream to be reliably sent and received. And you want [to] stream communications.

M: [inaudible]

Michael Baldwin: TCP and UDP are both built on IP.

M: [inaudible]

Michael Baldwin: Yes, sir. UDP is very close to IP; it adds addressing information on the packet along with a couple other things like a port number, because it knows what a port number is and IP does not know what a port number is and TCP adds that information and also does error checking and acknowledgments.

Yes, sir.

M: [inaudible]

Michael Baldwin: A connection under TCP is uniquely identified by your host address, your port number, the remote host address and the remote port number. That "fourtuple" right there uniquely identifies any TCP connection on the Internet.

Lively group! Lot's of questions! I didn't get so many questions yesterday.

Okay, typical active connect: We're going to describe this in broader terms before we talk about the function calls and snow everybody.

You want to create a socket, number one, you bind it to a port address, just like UDP, you set options and notification choices, just like UDP and then you launch a connection request. So that's the last step there; it's unique. And you catch notification of the success or failure of the connection and then you send and receive data according to the upper layer protocol, just like before; with a difference being that there is no record-blocking, so things can show up in a stream then it's nondeterministic.

Yes, sir.

M: [inaudible]

Michael Baldwin: I may have misspoken. I meant to say "dual-homed host", is where a host with two [inaudible] cards, for example, can have a unique IP address, so when you accept a connection, you can specify which host you want to reserve. . . establish that socket for.

Yes, sir.

M: [inaudible]

Michael Baldwin: "Notification" can be one of several mechanisms and I will talk about that on a slide coming up.

M: [inaudible]

Michael Baldwin: Absolutely. You can have 10 or 20. That's how we do it with like the TELNET Demon into a UNIX host. You can have a hundred people logged in, all to the same port. No problem. Because remember, the connection's defined as that fourtuple and as long as the source. . . and the source can't be the same. So the host address that you're connecting to, the host port that you're connecting to, as long as. . . one of the first two, which is the address it's coming from or the port it's coming from is different, there can be no duplication.

M: [inaudible]

Michael Baldwin: Absolutely. One to one.

M: [inaudible]

Michael Baldwin: Say it again, sir.

M: [inaudible]

Michael Baldwin: The question is: Can the same person open up two TELNET sessions? You certainly can. The reason is that your local port number will be different, because for two TELNET sessions you can't have the same local port number, as we talked about, so your fourtuple is unique. All right.

M: [inaudible]

Michael Baldwin: Yes, we will. We'll have different local port numbers, even though the port numbers that the host is using are the same.

M: [inaudible]

Michael Baldwin: They are IP packets. Yes, so there are IP packets that are going over the network that negotiate the connection that you are not aware of at the TCP layer.

M: [inaudible]

Michael Baldwin: Yes, sir. You'll be notified. . . we'll talk about that mechanism [a bit later]. . . Then you close the connection when you're done. When you close a connection, the other side of the connection is notified that you've closed the connection,

Okay, typical passive connect. This is a harder. . . the harder of the two with a little bit more going on. We create a socket, bind it to a port address. . . sound familiar. . . set options, notification choices and then launch a listen request. And "listen request" just enables the socket to accept a connection. And that happens very quickly. Now, a connection request comes in and then your application is notified of the connection arriving and then it's up to your application to accept the new connection.

So, there's actually an accept call that says, "Okay, we'll accept the new connection" and that's important, because we have to manage that new connection, we have to accept it. Then we have to set up dynamic structures to support that, because what if we accept 10 connections, so those are 10 management things that we have to have and then we close the

connection when we don't want to accept anymore connections. And, of course, we have to close those connections that we accepted.

M: [inaudible]

Michael Baldwin: Yes, sir. Oh, you want to go back? Okay.

M: [inaudible]

Michael Baldwin: I'm sorry. Pardon? As I mentioned early on, I've got all the PowerPoint demonstrations, I mean "files", that I can give to you today, including my presentation from yesterday; if you have a diskette.

M: [inaudible]

Michael Baldwin: Yes, I think that's a good idea, if you look at my Web site in a couple of days and do an FTP transfer. I'll put it out there. That's a great idea.

M: [inaudible]

Michael Baldwin: There you go.

M: [inaudible]

Michael Baldwin: No, sir. What I'll put up is a PPT file. I'll put the PPT files up that can be downloaded and then you just view it.

M: [inaudible]

Michael Baldwin: Oh, I've got handouts up here, so come up and get a handout.

M: [inaudible]

Michael Baldwin: Okay. TELNET. Let's talk about what "TELNET" is, so that we can figure out why we're here, because their upper-layer protocols are the reason that we write to WINSOCK to begin with; to solve problems.

So, TELNET is used to log into [a] remote UNIX host, commands are embedded in the data stream and the data stream has to be parsed, because you have to search for the commands, which must be responded to.

I'm assuming that there are some people in the audience here that are interested in WINSOCK because they want to write an application and, by far, more TELNET applications are written than any other type, as far as when we license our software, I've got more sales for our TELNET libraries than any other. So I thought it would be instructive to show this.

M: [inaudible]

Michael Baldwin: Good question. A typical application is a customer of mine that has multiple UNIX hosts in his organization and he wants to write a custom application that goes out to

those UNIX hosts and performs a task, perhaps on some kind of recurring basis, to capture information.

So an example would be to use TELNET in the background of your applications. So, behind your GUI, it doesn't have to be even shown. . . [it] can log into the remote host as specified in your organization, perhaps run a Sequel engine, do a query, get that current information and then build a graph.

M: [inaudible]

Michael Baldwin: Absolutely, you can build a server on a Window NT box, for example. . . [and] return any kind of information that you may be interested in.

M: [inaudible]

Michael Baldwin: You can. . . there are companies that offer Windows NT servers and we are developing one. . .

M: [inaudible]

Michael Baldwin: Oh, I'm sorry. Yes, Windows NT Work Station or Server can both be used to build an application of any of the types that we are discussing.

M: [inaudible]

Michael Baldwin: Only if you buy a TELNET Demon from somebody. Okay.

M: [inaudible]

Michael Baldwin: Well, it's probably easier to buy one for a hundred dollars than it is to write one.

M: [inaudible]

Michael Baldwin: Yes, sir, I have one under development and I think there are other sources.

M: [inaudible]

Michael Baldwin: Yeah, we're demystifying a lot of things here. And that's really good, because it's in stark contrast to the rest of the show. Okay, what the parser [does is] separate the data into commands and data. So if you build a TELNET application, that's what you have to do with the data that you receive over the socket.

Okay? Then you have to respond to those commands otherwise, as I note here, most hosts will halt communications if you fail to respond.

M: [inaudible]

Michael Baldwin: [What is] "the command" called is the question? They're called "TELNET Option Negotiation Commands" and they can occur at any time. I'll refer you to the RFC that describes what those commands are. Okay.

The typical TELNET connection is much like TCP, but typically you will connect to Port 23, then you search for those control sequences and then respond to them with, "I will do" or "I don't want to do those sequences. . those options". One will usually display data to the user for viewing and when you buy a terminal emulator from someone, that's what you see; however, you can use the same mechanism in the background as I spoke of before, to collect information across your network or the Internet for that matter, bring it back and if we have time we'll even demonstrate a connection to my host in Syracuse.

Usually you'll send ASCII data as the user types [it] in, but you could simply program it into your program and execute that, put a carriage return/line feed [inaudible] and run a Sequel engine on the host. Do any query you care to perform and capture the data coming back. You've done this.

M: [inaudible]

Michael Baldwin: The File Transfer Protocol deserves a couple of seconds, because that's the number 2 best seller in my product line, because people want it. . . it's the lowest common denominator as. . . in my benefit bullet, right there. Most common denominator for moving a file from Point "A" to Point "B". It provides authentication support in the form of the user name and password that you have to provide to log in or if you're an anonymous FTP, it's simply "anonymous" in your E-mail address.

Most file manager features are implemented and that's why when you go over to Delrina's booth and they'll show you their FTP, they provide you with a directory listing and all the files that are in there in the nice Windows environment, because it provides all that information and it supports binary ASCII transfers. A little known fact that is actually. . . means something when you're doing this, for a binary transfer, is an exact image; however, UNIX likes to standardize on an end-of-line sequence, because on UNIX, an ASCII file is just a carriage return at the end, but when you transfer a file off the UNIX host in ASCII mode, it will put a carriage return and line feed on the end, because that's the definition of the protocol.

So that's why when you get a file that was in ASCII mode, typically it's larger than you get it on your PC, because PC's like carriage returns and line feeds, like an edit box. The benefits are that its ubiquitous in that it's in every UNIX host, at no charge, even FTP; even Windows NT; Sparc Station and Server and its the lowest common denominator in any case, just for moving a file from Point "A" to Point "B". Its largest drawback is that it's inefficient for numerous files, because a unique connection is required for every single data file in order to comply with the RFC and that set-up time takes time.

M: [inaudible]

Michael Baldwin: Well, you certainly know. . . it cannot. It's specified in the RFC, but many UNIX hosts that you will come up against will not support that feature.

Yes, sir.

M: [inaudible]

Michael Baldwin: You send them serially, one after the other, over separate data connections. Yes, sir.

M: [inaudible]

Michael Baldwin: Yes, it would, because even though the RFC specifies some other techniques for concatenating files, and bring them across, not everyone standardized on it, so then nobody did it, because unless everyone does it, nobody can do it.

Yes, sir.

M: [inaudible]

Michael Baldwin: You know, the RFC doesn't say you can't do it, and when I design my libraries, I provide a mechanism for doing that and then when I started testing, I found out that it broke the server in order to specify a second one. So, the server forces serial transfers unless you wanted to have a separate FTP session. In fact I recently did this test for a customer: The question was, "Can you do a high-speed transfer on three files at the same time using our library?" And the answer is, "Yes, you can test it." Three different applications, but each one would have to process a file serially within the application.

M: [inaudible]

Michael Baldwin: No, actually there's a tighter loop in the middle there. Authentication happens first. . . good introduction to the next slide. . . [inaudible] control connection, pass user, log in information, over the control connection, create a TCP listening demon to do the first file transfer, pass the address and port of the demon over the control connection, pass instructions for the file transfer control, accept the connection and transfer the file data, then go back to Step 3. Create [a] TCP listening demon, pass the address, pass the instruction, accept the connection, transfer file, etc.

M: [inaudible]

Michael Baldwin: Yes, sir.

M: [inaudible]

Michael Baldwin: Oh, okay.

M: [inaudible]

Michael Baldwin: Well, you'll have to talk to your UNIX systems administrator. I'm not a UNIX systems administrator, so I don't have that information. Okay?

Let's see, we've got time to start probably on the Windows Sockets specification and you came in late; we do have a handout up here.

[Tape change]

Michael Baldwin: I love to talk about history, since I'm an old timer in this field, having started really in 1990, with lots of experience now, but the early DOS TCP/IP vendor's FTP software, which you'll see out there on the floor and Exolan or the EXOS line, which was actually bought out by Novell and became the landmark replacement for DOS product line, those two DOS products were not WINSOCK, but they were like a socket library, like UNIX and FTP still provides that interface to the kernel.

Those are proprietary libraries and the things wrong with that is that the developer of the application statically linked those libraries and since he statically linked to the libraries, his application was married forever to that kernel implementation. So, if I, for example, wanted to build an X-Server that would run on [the] Hummingbird, I would have to pick stacks that I would support and I would have a version for FTP software and I would have a version for Exolan because I would statically link into their libraries, okay.

So that's why, as far as history goes, that Manage and Distinct and the other TCP/IP vendors out here, all have a huge laundry list of applications, because history-wise, they are the only people that could write them and have the distribution mechanism, so all those applications which were bundled with the Kernel were sold as a complete package. And that went on for years. Okay.

Now the first TCP/IP vendor with a DLL was NetManage and I talked to those people and that was a big risk. I mean they broke away from the stack library mold and they said, "Well, O.K., I'll provide this dynamic-link library to my protocol libraries" and then Vendor A, Vendor B and Vendor C, they could write to that DLL, but it was an interface, so it was an interface specification and it was really the prototype for the WINSOCK specification. So, it was a little bit better.

Yes, sir.

M: [inaudible]

Michael Baldwin: Why aren't there sockets on the Mac? I'm not familiar with the Macintosh development environment, but I do believe that there is one interface library that does do sockets. I don't have enough information.

So proprietary libraries are part of Net Manage, but that was a huge step forward anyway. Now, once developers saw that, they said, "Well, why don't we have a standard across all of the kernel vendors. And if we had a standard across all the kernel vendors, then my application can run on all those kernel vendors." So [that] they don't have a proprietary advantage and, basically, lock in their users to their solutions. So Window Sockets was born in 1992 and the specification process spanned about a year there and some leaders in that field were NetManage, which was a very active leader in others.

Now, when the WINSOCK specification was established, all of a sudden some vendors with low-market share supported it. It was a great idea for them because it would make their product more valuable, because then [you could] mail a package from your door, for example, [and it] could run over WINSOCK. So a company could buy a TCP stack from Company "X" and buy Eudora and maybe buy a VT-220 emulator and run in that. It really ticked me off at the time, but vendors with market share. . . did not want to move to WINSOCK, because if you already have market share, it's in your best interest not to open up to a standard like that. Okay. But even Novell, with their horsepower, found it to their advantage, within a year, to release a WINSOCK DLL interface to their stack. Okay.

M: [inaudible]

Michael Baldwin: I'm sorry, Novell LAN Workplace for DOS. They provided a WINSOCK DLL interface. Basically an interface layer that would talk WINSOCK on the top and talk to their proprietary or their kernel on the bottom, but it gave them that layer there. My company was vigorously testing against all these implementations with our libraries while this was going on.

Why is it important?

WINSOCK is important because, number one, apps will run on any TCP/IP transport supporting WINSOCK. There are a list of vendors and Microsoft thought it was such a great idea that they made it part of the operating system. Which is my point two: As Microsoft and Windows '95 are adopted, Windows '95 is especially adopted on every desktop, the potential market of any application written to WINSOCK expands.

Michael Baldwin: Yes, sir?

M: [inaudible]

Michael Baldwin: Trumpet? Yes, "Trumpet" is a WINSOCK implementation also.

M: [inaudible]

Michael Baldwin: Well, it's not exactly free. There is a licensing fee involved if you are a company and it would be free to individuals using it for personal use.

M: [inaudible]

Michael Baldwin: Trumpet? Not to my knowledge. I was involved with the working group and there was a long list, but Trumpet. . . he may have participated. . . his name is Peter. . . [inaudible]. . . no, it's not Trumpet. Peter. . . he's Australian, I believe, so for geographical reasons I don't think he participated with a presence, but he may have had E-mail input.

M: [inaudible]

Michael Baldwin: Oh, Version 2 of WINSOCK specification is not set yet. We'll support a mechanism for requesting other transports, like IPX, Novell Standard or other X.25, whatever, there's a mechanism for requesting a different protocol besides TCP.

M: [inaudible]

Michael Baldwin: Say it again, sir?

M: [inaudible]

Michael Baldwin: Yes, I.I only supports UDP and TCP.

M: [inaudible]

Michael Baldwin: Okay, that's a good question: What do PPP and SLIP have to do with WINSOCK? And the answer is that those two protocols are used at a lower layer for transport across serial lines. You can't even specify a particular lower-level transport under the WINSOCK interface. The WINSOCK interface only gives you access to UDP and TCP and does nothing for you as far as how that information gets to you. Okay? So it [has] absolutely no interface for specifying PPP; for specifying dial-up information or other information that is required to establish [any] Internet kind of activity.

M: [inaudible]

Michael Baldwin: Yes. It's surfaces at the WINSOCK the only service that you can request is TCP or UDP, even though PPP could be routing multiple protocols like IPX, intermixed with your IP packets.

M: [inaudible]

Michael Baldwin: No, you cannot. The best you could do is specify multiple Internet addresses for the different interfaces and then specify the Internet address, which you can do.

M: [inaudible]

Michael Baldwin: I'll talk about that in a slide or two. Gotcha. Okay?

ComSoftware 101: This slide is labeled "ComSoftware 101" because there are three types of interfaces into communications that can be used via software. And the three types are, starting at the top (and this is something I had to learn before I could get to square 1): "Synchronous Blocking" A Synchronous blocking function is a function that captures the thread or the thread of your program, execution, and returns from the function when it either is successful or it fails. It is very typical in UNIX operating systems, which is a multi-threaded operating system, especially before user interfaces like Motif were invented where you needed response on other parts of your program. It was typical, for example, to make a connect call that was synchronous blocking, that a second later, perhaps, it would return with a success or failure of the connection. That was typical in the UNIX environment. And it would not interfere with any other processes that were going on.

Now, synchronous non-blocking? Well, "nonblocking" refers to the fact that it goes into the function and returns without blocking for an indefinite period of time. So, you capture the thread, it returns quickly and that's a technique that is available through WINSOCK, as is the first technique. And it was very typical under DOS where you would typically poll for completion information.

The preferred event-driven approach that we utilize in our libraries and that I would recommend that anybody use that interfaces to WINSOCK, is asynchronous non-blocking. And what "asynchronous" means is that you'll be notified, in an asynchronous [manner] when it is finished. And it's non-blocking, because it doesn't stay in the function while this is all happening. It returns immediately, sets things in motion, then you're notified [of] any event triggered.

That's implementing the WINSOCK specification, by setting a couple notification choices in the IOC/TL socket function. You can specify a Windows message that will be generated to your Window to notify you of a connection, notify you of when there's data to receive on the socket and notify you when you can send more data.

So WINSOCK can call blocking functions if you want, but under Windows for Work groups, I haven't verified it or not under Windows NT, what the actual case is, but the specification says that you can only have one blocking function at a time in the WINSOCK library and I don't know if that really applies to Windows NT, but it's in the specification at any rate.

So that second blocking call into the WINSOCK library will fail and it doesn't have to be the call from your application; it could be a call from the second application that's trying to do something, so it's. . .

M: [inaudible]

Michael Baldwin: Is there any reason to not use a blocking function?

M: [inaudible]

Michael Baldwin: There is no reason except that it's a little bit harder to set up, because it's event-driven and you have to set up some things, so that's the only reason is that it takes a little bit longer to set up the event mechanism.

M: [inaudible]

Michael Baldwin: . . . computer. . . into the WINSOCK DLL is allowed.

You can call non-blocking functions on a timer, but polling is inefficient, so you can, for example, call connect [e word] block and keep checking. Call connect success. So that is an alternative mechanism, but as I stated earlier, we recommend using the trigger mechanism for all WINSOCK interface tasks.

You can't interfere with another task when you do it that way and all it means is that you handle things on event notification, which means you just put your code in someplace different.

A typical active connect [which] we talked about earlier is all those things: create a socket, bind, set options, notification choices and catch notification of a connect. We'll go through the actual calls at a conference desk, since this is a WINSOCK 1.1 specification.

The first thing we do is call the socket function. It's a socket function and one specifies the socket stream or socket [inaudible] for DDP socket and I'm not going to go into intricate detail here, saying what all the parameters are, but I'm just going to talk about the important ones. Just so you have a feel for it and you can look. The WINSOCK 1.1 specification is available on the Internet and my last slide will tell you where you can get it.

Then you bind it. Okay, so you take your socket ID, now you've got that and its one of the parameters of the bind and you set the port number and address, if desired. You cannot set a port number and an address if you do that. The library will assign one to you that's not used. So you don't have to specify one. In most cases you had no need to specify one.

M: [inaudible]

Michael Baldwin: There's a structure. . . a C structure that is a parameter of the bind statement where you fill in the blanks, port and address.

M: [inaudible]

Michael Baldwin: Yeah, I think only one is supported if you look. . . it's pretty detailed; I didn't want to put it in here, but there's a network family that you specify to. And I think only one is even valid.

M: [inaudible]

Michael Baldwin: Yeah, I'd have to refer you to RFC and [the] WINSOCK 1.1 spec, it describes that. It's about 200 pages.

The WSA [selects] its root from the select function in the UNIX socket library. What it does is it establishes what notification you desire and it takes as a parameter the Windows handle of the window you want notified, the message number, the user message number that

you would like it to use for notification purpose and then it reports any errors as parameters in wparam and lparam. It reports whether or not the socket, a listening socket for example, has just accepted the connection or is ready for you to accept the connection on it, or the connect just occurred, or there's data for you to receive, or the WINSOCK buffers can accept more data that you are sending. So that's the type of information that using this mechanism here can trigger. . . it's called [event]-triggered and there's several pages of description on this. . . on the specification that I'll refer you to for greater details and there's a lot of detail there.

[File] control socket is the function that is used to enable or disable non-blocking operations, so you have to use this [for]. . . blocking operations so that there is async select. . . can be used for the event notification.

It can also be used to determine the amount of data that can be read, so within our library, for example, since we don't know the application that is going to be used, we have a dynamic buffer and when there's a large amount of traffic coming to the PC, we'll use this to check how much data there is. If our buffer isn't big enough, we'll dynamically allocate a larger buffer, read in all the data and report it up to the application. It also checks for urgent data, which is not normally necessary.

On the connect function: It takes as a parameter such things as remote address and remote port. It sets it in motion, some IP negotiation that attempts the connection and acknowledges the connection.

A blocking socket, as we talked about before, can capture the thread for several seconds and then return. You can use select to determine the completion of the connect request on a non-blocking socket. That is like the UNIX socket library select function or, which we recommend and is a little bit easier to use from my point of view, you can use the async select function to trigger the event notification.

M: [inaudible]

Michael Baldwin: Well, it depends if you allocate a thread for the communications or not. You may, you know, you may not or the typical programmer would not, and it's unknown to me whether or not you [can] do a blocking operation on the Windows NT operating system. . . the WINSOCK specifications says you only are allowed one.

Now, whether or not Windows NT allows more than one, I don't know. When you develop an application for [the] WINSOCK spec, you should adhere to the spec, because you can't assume any different behavior.

So if you were to do a blocking operation on a connect, there is a possibility that a competing application, also trying to perform a blocking synchronous operation, would be shut out, which is not a very friendly thing to do. So that would be the reason why you would not want to do that. Although we're developing a VT-220 emulator with multiple Windows and we're actually establishing a thread for every [NDI] child.

M: [inaudible]

Michael Baldwin: It's really possible that it's okay, but you have to develop it to the lowest common denominator, because, I mean, one user may be using a kernel from a different manufacturer, under Windows NT for a particular feature and then you would not want to have your application break.

M: [inaudible]

Michael Baldwin: The “receive” function is used to receive data on TCP connection, so you specify like [inaudible] to your buffer and the length of your buffer and they’ll just fill your buffer with as much data it has or the length of your buffer, whichever is smaller. If its a blocking socket and no data is available, it will capture the thread within the function until at least 1 byte is there, which is not a very friendly thing if you have a nice interface all built up. A result of zero bytes in the case of [a] closed connection is the only positive indication of a closed connection [so that] when you do the read and you get zero back or do the receive and you get zero return.

M: [inaudible]

Michael Baldwin: That’s correct. There is both, actually. There is an event notification of a FD closed, however it’s kind of like informative only. It doesn’t indicate that you’ve read all the data of the receive buffers, so the only positive indication is a zero return from the receive function.

M: [inaudible]

Michael Baldwin: No, you cannot. You’ll get notified of when 1 byte is there and then. . .

M: [inaudible]

Michael Baldwin:. . . does what do any buffering?

M: [inaudible]

Michael Baldwin: Yes. The question was: If there’s 1 byte in the buffer you get and after you receive notification and by the time you service the request if there is more data in the buffer, [will] it take all of it if you attempt to? Is that correct? Is that what you were asking?

M: [inaudible]

Michael Baldwin: The typical application is that the processing speed is hugely fast compared to the communications, so that you want to be notified. . . you want to know about just a single byte, because that’s typical when a TELNET demon, for example, receives every single byte on a keystroke-by-keystroke basis.

The “send” function is used to send data over the TCP connection and the strange thing about it is that there’s no guarantee that it will accept all the data that you submit, so [if] you want to send a thousand bytes. . . it may accept 10 bytes, okay. So what is happened here is that it’s accepted part of your message, but not the whole thing. So when we built our libraries, we had to build an entire queuing system, where. . . so I have a queue of buffers, so that basically as the queue . . . the queue has to be emptied at the pace that the WINSOCK kernel can accept the data.

M: [inaudible]

Michael Baldwin: There is no function that allows you to find out how much data the kernel can accept.

M: [inaudible]

Michael Baldwin: No, I'm not sure if it's really necessary. It does impose a burden on the application developer, though. That he cannot assume that all the data can be accepted. That is true.

M: [inaudible]

Michael Baldwin: The way it operates, and this is the way our libraries implement TCP, is that, for example, 10,000 bytes are presented to the send function for transmission; 100 bytes are accepted. We make an internal buffer of the remaining and its in front of the queue and then we have FD send notification enabled so that we're notified when the WINSOCK layer can accept more data and we try to send all its remaining 9,900, if my subtraction is correct and then it will take another 200. . .

M: [inaudible]

Michael Baldwin: A very good question; it's called "back pressure." Because of the way the TCP protocol is implemented, meaning that there is an acknowledgment and there's this buffering that goes on, the actual mechanism is that the IP packet is sent and if the application on the receiver's side does not receive the data, it just sits there in the buffer, okay.

Then the next IP packet comes and there's room in the buffer, so now there's two IP packets and the acknowledgment is sent back, "Yes, this is what I've got and I got it" and then. . . but no receive. . . but the receiver is not taking the data out of the communications layer yet. So the third IP packet is sent; however, the receiver no longer has any buffering space, so it drops it. It's dead. It times out. If the time out period is typically like 20 seconds, there's no acknowledgment that says, "I received IP packet No. 3", so what happens is after 20 seconds, another one is sent and this continues to happen. If it continued to be dropped, there's a notification that there is a network failure. However, what is typical is that the receiver is like a slower host and it's just processing things more slowly, so that the second attempt is acknowledged. Okay, and that's called "back pressure" when this happens, when these time outs occur, it's called "back pressure" and it's the way the TCP compensates for the fact that different hosts. A Cray talking to a 286, okay, this probably happens a lot.

M: [inaudible]

Michael Baldwin: They could have. In fact the value-add for our library is that we do all the buffering in that we provide a notification back saying that all of the data has been submitted to WINSOCK, so that's a value-add of our library that compensates for that deficiency.

WINSOCK 2.0, there will be a mechanism for providing, like, an entire buffer. It'll make a local copy, just like what we did. I think that's being addressed.

M: [inaudible]

Michael Baldwin: A very good question. Microsoft distributes an MFC class called "C-socket" and there's a very thin wrapper around the socket library and does no more than put the send function in as a public method within the class and does not provide any increased functionality. Okay. That's, I guess that's the value-add for a library like ours.

Yes, sir.

M: [inaudible]

Michael Baldwin: Priorities for what?

M: [inaudible]

Michael Baldwin: No, there's no mechanism for doing that because we're a stream. First in; first out.

M: [inaudible]

Michael Baldwin: We'll quickly close with this slide, I think. "Closed socket", closes the connection after handshaking with a remote host so the remote host can notify the application that communications are closed, although a socket parameter can be used to specify our hard close, which means that no handshaking occurs, so it's a non-graceful close.

M: [inaudible]

Michael Baldwin: I'm sorry, sir?

M: [inaudible]

Michael Baldwin: Absolutely. Either side can close the socket.
Okay, we'll continue with this after a brief recess. Let's take about eight minutes.

[Break]

[The initial portion of this section of the tape is grainy, inaudible and speaker is far away from microphone]

Michael Baldwin: . . . And the functions that are used to implement this are like the previous as far as [inaudible] socket binding to a port, set option notification choices and then all the listen functions.

You call the listen functions [inaudible].

And then if we selected the notification choice of asynchronous notification, then you're notified of an incoming connection and then you use the "accept" function to create each connection, okay?

So it's like this list right here [inaudible]

M: [inaudible]

Michael Baldwin: Yes, sir, did you have a question?

M: [inaudible]

Michael Baldwin: The other thing that makes it hard is that the dynamic allocation of an indeterminate number of connections of. . . that actually. . . a C++ gives us nice mechanism [inaudible]

Even in MFC (Microsoft Foundation Class) you have a NDI parent that is really nice for doing the listening and then spawns an NDI child for every connection, which provides the framework for “X” number of children, which I like a lot.

The “accept” connection actually extracts the first connection in the queue of any connection, so a listening socket, for example, might be blasted with two or three connection requests and then the accept function is called for each one, all right?

So these [spawn] new, accepted sockets and the accept function actually returns as a unique socket [inaudible]. Then an object-oriented development environment helps manage the dynamic creation of. . .

A typical UDP session as we described earlier in the presentation is the same as far as creating socket and the notification situations, but as we learned, there is no connection. There is no connection involved, so there is a function called “send to” that allows you to specify the address and port where you want to send the packet to. I mentioned in the last [section] that a broadcast address can be used to send to all hosts on the physical sighting at the port specified.

So “send to” is different from “send,” because you have to specify the address and port of the destination.

And “receive from” is like “receive”, except that at point or two. . . you have to provide a location for the network address to be updated, so that you know where the UDP packet came from. So you have the address and port of the source; of the UDP packet.

Any software developers here in the room of Internet applications? I’ve thought about, well, what if I was to write an Internet application, sell it to everybody in the world or give it away and then send UDP packets. . . information on everybody’s hard drive or whatever. . . but on the Internet there’s nothing keeping something from putting that into an application.

Other people would go absolutely. . . go up in arms. . .

M: [inaudible]

Michael Baldwin: Well, I don’t know. I wouldn’t know about anything like that.

The “select” function is a blocking notification technique in that. . . I won’t give you the particulars on that unless anyone would like me. . .

I will introduce some miscellaneous functions here. Get [inaudible] name and give the name of the. . . and the address of the. . . at the other end of the TCP connection. You can get the address of the local name of the local end of the TCP connection. There are some options that you can query. The WINSOCK [inaudible] as well as setting options. You can do various levels of shut down; shut down receive, shut down send, on your socket. These are things that are kind of off to the side. Some utility functions called “HtoNL”, which is “Host To Network Line”, which helps us resolve whether or not it’s a big Indian or little Indian architecture on the host. I mention it just so that you are aware of it. INET-AdBR, changes a dot notation into a 4-byte address and INET-Net2 alphanumeric, changes a 4-byte address into a dot representation. These are just general utility functions that I provide as part of WINSOCK.

And here are some database routines, just to be complete. They’re not typically necessary or used, but they’re mostly included. . . the ones on the left, because the designers of the WINSOCK specification wanted to comply with the socket library. . .

[speaker just brought microphone closer and is now audible and clear]

Michael Baldwin: . . . to the greatest extent possible and since the UNIX socket library, on the left, provided those functions, they were rolled right into the WINSOCK specifications.

And remember, that the socket library was designed for BSD sockets on a Berkeley, how many years ago? I'm not sure; 20 years ago?

[Tape change]

Michael Baldwin: 13 years? That's a guess?

So they were reported over to the WINSOCK side and then the W-async functions were like asynchronous mechanisms for the same function calls. So [for] anything that the WINSOCK designers thought was synchronous blocking, they provided a non synchronous asynchronous notification.

The way all those work is that you provide the window handle and the message and then that window handle and message is called when that information is ready.

An interesting one that we use all the time is on the bottom, right "Get host by name", which is necessary in our library, so if I want to connect hp.dart.com, that has to be resolved into a Internet address, which may involve querying a domain name server, which may be over a slow link, like off a dial-up link out of your office onto some host someplace. So since that could take several seconds, it is a good idea to do something like that asynchronously.

Here are the remainder of the WSA functions. WSA startup — initializes the stack. WSA cleanup — uninitializes the stack. Some utility functions for getting the last error, set the last error. A question function — . . . is there a blocking function currently being handled? Set blocking hook, where you can install your own peak message loop instead of using the default for the handler, but all these issues only really come up if you're doing blocking calls and if you don't do blocking calls, then you have no need for these functions.

M: [inaudible]

Michael Baldwin: Yes, it does, and I don't know what you would use it [for]. . . the stack vendor would typically use it. So I can't think of a case where an application developer would want to use that.

M: [inaudible]

Michael Baldwin: "Set last error"?

M: [inaudible]

Michael Baldwin: Well, the way it works is that it's only valid really when you are notified that the error is present. So there's an event notifying you of the error.

"Development Environment, Section 3": The reason that I have this [is that] Section 3 talks about the different development environments because not everybody is a C or C++ programmer. In fact, as time goes on, fewer and fewer people are and more people are in fourth-generation languages like "Visual Basic" or "Adelphi" or these other. . . or what, sir? Or "Power Builder", there we go.

So in this section we talk about how you can get to the WINSOCK layer using those mechanisms. And I guess since we're developers of protocol libraries, that are in these environments already, I speak pretty intelligently to the problems associated with each.

M: [inaudible]

Michael Baldwin: The WINSOCK interface, which is a DLL, can be accessed, very conveniently, from any C-compiler, because they're structures that are often used for. . . and pointers to those structures, so that a function call, for example, like "receive from", requires a pointer to. . . a place for 6 bytes, so that the address in [the] port can be put in that buffer. So if you're in the Visual Basic environment, for example, you have to not only figure out how to make the DLL function call, but secondly you have to figure out how to provide a string pointer for that information to be inserted, okay?

The MFC supplies a C-socket class library, as the gentleman brought up earlier, and that library provides a thin wrapper around the WINSOCK function calls and has, as like a data member, a socket number and perhaps some other information. But it doesn't really add too much to the functionality or the limitations. . . or it doesn't compensate for the limitations of the WINSOCK layer.

From Visual Basic, it is difficult to use asynchronous notification and all of my customers that I talk to that have tried using Visual Basic against the WINSOCK interface have been doing it from a polling. . . a polling, non-blocking-type mechanism or polling blocking mechanism. But the real limitation of. . . of Visual Basic, after you get the data, is that you still have to implement an upper-layer protocol and Visual Basic, although it's easy to use, it's hard to bring to bear the structure, for example, to do an FTP transfer. There is a lot of coding that, although it can be done in VB, it is difficult to do a good job at it. Okay?

M: [inaudible]

Michael Baldwin: Yes, I'll introduce. . . some of those higher-level libraries in the next slide or two.

In "Adelphi", we just put together a Adelphi tool kit where we interfaced our DLL's into then. . . it was a challenge to establish that glue mechanism, but it can be done. And it can work with effort, but we still have to implement the upper-layer protocol.

In "Power Builder", we had difficulties integrating into Power Builder, because asynchronous event notification is impossible and if the gentleman back there can show me a way that you can get that in a Power Builder environment, I'd be happy to learn that. So you're trapped into a polling-type mechanism to check if something has been done or has completed.

Now [inaudible] can be constructed in "C", that provide a different interface. . . a specialized interface for you that eliminate some of these problems. For example, if you wanted to implement a polling mechanism, because there is a no-event-driven notification in your environment, like the Power Builder example, you could build. . . well, in "C". . . implement the WINSOCK functions and then have like a function that you could call, like once a second or something, to tell you something was done. So you could have all this activity generating in the DLL and then under Power Builder you have something set up where you call it [inaudible] or something like that, that function. And that can be done not too difficultly.

You've done this (laughter). Yes, you can have a wrap around the WINSOCK DLL that's specialized to what you want to do and then you can build all that and then have some kind of non-intrusive polling that is insulated from WINSOCK, but you can implement [it] like a state within your DLL. And check that. Okay, so, that's one approach. You can do that.

Another approach is to not use a DLL, but use a VBX or an OCX and in Power Builder, for example, we had a lot of difficulty integrating our VBXs into the Power Builder environment and it required a couple patches from PowerSoft, but it actually does work and we have a tool kit that integrates our VBXs into the Power Builder environment to do an FTP transfer or log onto a TELNET host or listen for connections.

So, VBXs are a way that the event mechanism. . . VBXs have an event mechanism built into them and it was kind of unique that that was the only way that we could integrate in any of our libraries into the Power Builder environment; because they had to support the event mechanism from Visual Basic. Because if they didn't, they couldn't claim to have VBX support. So that was a very powerful mechanism that we could take advantage of.

"Adelphi VCL Components"? You can create a DLL and then create a Adelphi VCL wrapper. I think it stands for "Visual Component Library", but it's a way that you can glue a DLL into the Adelphi environment and basically have the same thing that you have in the Visual Basic; a component you can drop on a form. Or you can use OLE components that can integrate WINSOCK into any environment with an OLE container. You know, today, there's, I think, Access. . . the data base language has support for 16 bit OCX. . . OCX's and of course Visual Basic, that was just released in September. Visual Basic 4 has support for OCX containers and we just started shipping our product this past Friday. We're 32 bit and 16 bit OCX'S or OLE components.

So these libraries all use WINSOCK and we'll introduce a couple sources here for components that provide value-add to the WINSOCK interface and by "value-add", I mean they can implement an upper-layer protocol, so you don't have to do it within your application. They have been tested, to one degree or another, on multiple WINSOCK stacks, so that odds are you won't run into upper-[inaudible] problems. For example, WINSOCK interface has been tested for a year and a quarter now in many, many different environments and since we've had the opportunity now to do that, we have very few problems with our libraries being run in any environment.

"DS Socket by DOLPHIN Systems" is a shareware component, has no run-time fees, like \$89.00 or something. You can have a license to distribute that with your application. "IP Port" is a similar type product and they provide an interface between the VBX and the WINSOCK DLL and various levels of other value-add. Both, for example, simply do a TCP protocol and provide a data stream. Whereas our product, for example, specializes in TELNET or FTP and Simple Mail and [Pop 3], so those are fairly simple.

The negative or the bad part about them is that there. . . the good part about them is that they are low cost or no cost. The bad part about them is there is little or no support. They can be found on the Internet and CompuServe, American Online; places where you normally download things in different levels of quality.

Yes, sir?

M: [inaudible]

Michael Baldwin: For the what kind of environment? "Imbedded environment"?

M: [inaudible]

Michael Baldwin: Well, any kind of imbedded application on this. . . the Pacific Coast, you probably won't find any components, because there's a very small market there.

M: [inaudible]

Michael Baldwin: You'd need the source code and there are some vendors that supply source code for TCP/IP stacks in the environment you're talking about.

M: [inaudible]

Michael Baldwin: Right. There is basically source code that you would have to compile for your target. . .

M: [inaudible]

Michael Baldwin: Fusion is one. Fusion. . . you should look in "Imbedded Software Magazine". That's where that type of thing is advertised.

Talking about commercial components? Commercial components cost money, but they provide some nice things like technical support. They usually offer more value-add with upper-layer protocol; take your pick. You buy the component for the protocol you want to implement and then technically it's plug-and-play. Samples are provided. [inaudible] in tool kits provide comprehensive examples. Tool kit costs range in the order of \$298.00 to \$698.00 and charge some type of user-based, run-time, licensing fees. And I'll compare and contrast those in a second.

Some offer fixed-fee licensing. So these are true, industrial components available from NetManage, for one. I understand they're out here. They are offered tools as VBX's as what I saw at VBITS in June, in New York City where they had just released them. They may offer OCX's, too. I'm not certain.

The only negative of their tool is that they require a licensing of the kernel, because their tools interface to a DLL and the DLL is only available in licensing as part of their kernel, so there tools won't work on Microsoft, for example, because it's not licensed that way.

So it's a technique to bolster their own product line.

[The Distinct] Corporation who is not here, they're my major competitor, and they call it their run-time extension. What it is, is a \$50.00 license, okay. . . so you build an application with their tool kit and then it's a \$50.00 license for every host where you host the application and it's clearly unsuitable if you have thousands of hosts that you want to put the application, although they'll, of course, negotiate a license. . . a user-based license and get the price per copy down.

Dart Communications, my firm, we offer three options and because of the three options, we do a lot of OEM-type licensing. We do have a run-time license, so we compete head-to-head with Distinct, although we discount it just a little bit as an incentive for us.

We have a distribution license [with] limited distribution and we have OEM partner subscription, that includes annual maintenance and support and that's the one where we really win; on the third one, because no other vendor offers a mechanism to update the library if there's a problem at one of our customer's customer location or environment.

Some final thoughts and then we've got a live Internet here, so we can actually run through some code and do a live Internet connection up to my home office in New York and we'll look at some of these functions and how they're called.

But, first, Internet software. . . great opportunities exist and when you [walk] floor here you can see. It's just an explosive market and there's more applications for it than software that's been written yet, so you know, if any of you are developing applications or looking at commercial applications or starting your own software company, it's just outrageous. It's terrific.

The WINSOCK interface requires a great deal of testing over a multiple stacks, so I just throw that out as a word of caution.

M: [inaudible]

Michael Baldwin: Yes, there is a company called "Stardust", yes. And one of the principals of Stardust was the lead architect for WINSOCK specification, okay, I.I.

M: [inaudible]

Michael Baldwin: Pardon?

M: [inaudible]

Michael Baldwin: A WINSOCK.DLL is the dynamic link library. . . is the 16 bit version that implements the WINSOCK specification, so. . . the specification is one thing and whether or not Microsoft sells it as part of Windows 95 or Windows NT or NetManage sells it as part of their environment or Distinct sells it, it's all WINSOCK-compliant and they all have their own version. Okay?

M: [inaudible]

Michael Baldwin: They are different products.

M: [inaudible]

Michael Baldwin: That's right. It's not an issue if you limit your product to a particular WINSOCK vendor. I'll make the point that I think Visual Basic primarily and Adelphi, secondly, is a rapid application development environment for implementing applications. I say that because I can write a VB application in two hours in Visual Basic and I can demonstrate one for you that took me two hours to write that incorporates all sorts of functionality. I gave it to my Adelphi programmer, who had to figure out how to do this in the Adelphi environment, and it took him three and a half days. Then I gave it to my C++ developer, who is a very talented, gifted, young man and it took him five days to do it in Visual C++. So. . .

M: [inaudible]

Michael Baldwin: I think it had something to do with the fact that it was Version 1.0 of Adelphi; the documentation wasn't up to spec. . . some work-arounds had to be accomplished. It was a new environment for my developer. He'd been in it for two months, but from his feedback, it was the combination of all of those things. But even after he explained that to me, I still think it would be a one-day-plus job for an experienced Adelphi developer.

Additional information: Richard Stevens of UNIX Network Programming, I use that kind of as my own big reference. . . big reference. . . on UNIX [inaudible]. Since UNIX is a host to TCP/IP, I use it as my de facto reference.

A second source: Internet site sunsite.university.north-carolina.edu and I did that from memory, so I think I got the right directory. I used to have it memorized for all my customers, but if I missed it by just a little bit, I'm sure you'll be able to find it; it's buried there in PUB. In there you can find all sorts of public domain. . . a WINSOCK source code. You can find the WINSOCK spec there. Information on WINSOCK 2.0. It's a great source. You might even see my tool kit there. Mr. Douglas Comer, he's got a series of [inaudible] protocol books that are quite complete and he kind of specializes. . . there's several in the series specializing in different areas like upper-layer protocols, WINSOCK and more basic stuff.

So, I am prepared to go through a sample here in Visual C++. We've statically linked in our libraries in debug mode, so I can show the functionality of a TELNET session. We can stop the debugger when particular things happen and kind of look at that.

Before I do that, are there any questions that I can address?

M: [inaudible]

Michael Baldwin: Well, I don't know. I don't know if a schedule is even relevant, because it just gets slipped. It's hard to come to standardization on thing like that, especially when there's no driving force; there's no big leader. It's like an agreement.

M: [inaudible]

Michael Baldwin: I don't know. I don't know. I'm not involved with it. Yes, sir?

M: [inaudible]

Michael Baldwin: Calls to the WINSOCK DLL?

M: [inaudible]

Michael Baldwin: All of our calls are to the WINSOCK DLL.

M: [inaudible]

Michael Baldwin: Let's see. I'd like to show one additional slide here that illustrates the question. This was a question that came up earlier and I failed to have this slide in that presentation.

Software Layer Support Productivity Tools and the gentleman had asked earlier about the standard OSI model here on the left, which starts from the physical layer at the bottom to data link network transport, et cetera. And how TCP/IP adapts to those OSI layers. With TCP and UDP in the transport layer upper layer protocols have traditionally been implemented right in the application. So if you got source code on an FTP client, it's available on any UNIX host, you'd see it's one, big application.

With our Power TCP libraries, we handle the session layer stuff and provide a special interface that implements the upper layer protocols. It can be thought of [as] occupying the session layer and below our product. Shown right here is the WINSOCK interface, so it's not exactly true. I'm taking a little bit of liberty pointing to this and saying it's [the] WINSOCK interface, because it's really not, but it's. . . the mechanism where our library or any WINSOCK-compliant application communicates with the TCP/IP service layer and that's documented as the WINSOCK interface.

Right here is any interface that communicates with the calling program and if it's a Visual Basic 3 calling program, and the library uses VBX, anybody's VBX that would be using properties and events. Or likewise if it's an OCX or if it's a C++ DOS library, that is where the user's class is and this is the class that is used as the base class that the user's class is derived from. Or if it's the DLL interface, then this is the DLL specification of the function calls within the DLL.

M: [inaudible]

Michael Baldwin: Well, we would probably, for the sake of our library it would make sense to be 1.1 compliant, because then we have a broader. . . then we aren't locked into 2.0. 'Cause 1.1 should be upwardly compatible to 2.0, at least that's stated in the intent of the specification, so we would leave things as they are, so that we would not interfere with any of our customer's applications in their interface.

M: [inaudible]

Michael Baldwin: You have to know it or you have to know the name of his computer; one or the other.

M: [inaudible]

Michael Baldwin: He does? Or somebody does?

Okay, we'll illustrate first one sample that with no security; no encryption in the clear, okay.

"SSL" which stands for Secure Socket Layer is a. . . I don't know. . . I know Secure Socket Layer is an encryption mechanism and I don't know what level it was built in. I don't believe it was built. . . I think it would be an encryption level before any data is passed into the underlying WINSOCK, okay?

M: [inaudible]

Michael Baldwin: Yeah, so it would. . . it's probably, you know, however that encryption is done, it happens just before it's submitted out the send function. You know, that's my understanding. Anybody can correct that. But a Secure Socket Layer is just a name for an encryption mechanism.

Now, this is an echo server that we wrote to illustrate the. . . how ports accept connections and there are about. . . in the Visual Basic version of this there are like 30 lines of code in the whole thing and out of that, there are about 9 or 10 lines of code that use our libraries, but what this echo server did as soon as I started it up, it started listening on Port 7 and this is an NDI parent form and there's a little C++ object associated with the NDI parent and what we're going to do is when I press this "test" button, there are five C++ objects, actually, right here: one, two, three, four, five and we'll make five connections to ourselves to Port 7 and after the connection occurs, we're going to send this data over the connection and then over here when every connection is accepted, we're going to dynamically create an NDI child window that will display the data it receives and then send back the data, so echo it back. Okay?

M: [inaudible]

Michael Baldwin: We're using. . . yeah, we're using a loop back to the same IP address. Okay, when this listener started listening on Port 7, it reported back what local IP address [it] is and then when we make the connection, we make the connection to ourself, so it's a loop-back mechanism. So it's routed down to the IP layer and then where it knows that it's going to this port on the local host and pushes it back up to the application and when we push "test" here. . . it happens very fast. Since this is C++ and [this is] a fast notebook.

On my 486 in Visual Basic, it goes slow and for Power Builder it goes very slow, because of the overhead, but if we close down a connection right here, we do it gracefully, so the other side knows about it and when the side right here is in [inaudible] we just, as visual cue, we close that down. We [inaudible] out the box. Okay, Connection 3 terminated.

So if we do a test, it closes them all again and opens them all again, okay? And if you want to send data, you know. . .

M: [inaudible]

Michael Baldwin: Yeah, this is a two hour app for me, okay, and obviously I am very familiar with our VBX libraries. This was, once I did this prototype, it was a 3-day project for my Adelphi programmer with two month's experience to implement it in Adelphi. After he had already created the DCL components, but he had to learn how to do the NDI child window and, you know, that stuff that he'd never done before.

Then my C++ programmer. . . I think it. . . by the time he was finally done and it was debugged to this level, it was probably five days, possibly four, but he's a very gifted and talented programmer, okay, and it was already. . . he was familiar with the libraries, so this is our. . . it's pretty cool. I use it as a demo, because it shows so many things.

M: [inaudible]

Michael Baldwin: Yeah. Let's do that.

M: [inaudible]

Michael Baldwin: This was myself, right here, this is a loop back, so I made connections right back to ourself.

The very nice feature about TCP/IP is they can be used for interprocess communication on your same host, so your application can run anywhere on the Network or on your host; it doesn't matter.

M: [inaudible]

Michael Baldwin: Yeah, I've got a UNIX host in HP, up in Syracuse that we're going to run through the development environment, which is kind of fun because it's pretty "live", so to speak.

So right here I have statically linked into my TELNET application all of our Power TCP libraries. And this is my window handler, right here that yesterday I had all sorts of interest in how this was implemented, but it's my window procedure that handles event notification, so. . . let's put a break point at two places; we'll put a break point at a "receive event" and "receive data". Then in our connect, where we call the connection function, we'll see what's implemented when we do the connect.

Here we go.

And we put the break point right there in our TELNET [inaudible] connect function, okay?

Now, we'll run this. . . TELNET application. . . and we'll connect up to our host in New York, so this is what it looks like. It's by VT-220, because it's got a VT-220 class in there. We'll connect up to my local host address which is my office in Cassanovia. We press the "connect" function and we're gonna launch this connect request with the remote host name.

Let me show it to you here. . . 204.7.222 to the remote port which is 23 and those are the only parameters that are being used at this point and we'll illustrate the. . . in our library, which is Power TCP connect function. We call this function here, which is the sync, okay? We check for the status and we're not. . . we are closed, so we're okay. Save the flags. We initialize the network and so first we make sure it's not initialized and then if there's no sockets. . . no socket count, we initialize the class. . . register the class, okay? Then we create the window, which is our event notification window. Then we create another window, also for putting in information and then we set the font on the VT-220 emulator, which will step over, implement the socket count, set the caption, do some housekeeping information here and we. . . check some licensing stuff, check the time.

Now, we're making our WINSOCK calls. We just called WSA Startup, okay, which put information in data and we have the local hosting which is something we found out hans.dart.com, okay?

Then we allocate some memory and we resolve the local name into an address for information purposes. That's an asynchronous call. More status information, okay, we initialized everything.

Then we change our state to connecting for defensive purposes. We resolve the address. Get the address event. We get some more information. We establish the sockets, so this is the socket call and the socket that's returned is Number 2. Set flags. We do the bind, which binds the socket to local address and, which is not specified at this point, we then do a select on the socket that we want to be notified of a connection event when there's data to read; when there's data to write and are closed. This select event selects the notification choices right there, so that we're completely synchronous.

Then we launch a connect request. I'm going to step through here synchronously, okay now, I stepped across it, come on, and it returns. So now it's armed. Now we're going to let it fly.

One of the problems with doing this and what. . . we'll run it again, only this time not stop it in the connect event. . . one of the problems of doing this is that if you're stepping through in debug mode, sometimes you can interfere with the communications timing, so this time we'll just hit F5, and let it go.

I think they disabled my Internet connection again.

Just to be sure. . . they did this to me yesterday, early. I don't know why.

M: [inaudible]

Michael Baldwin: I will, but if this thing is [inaudible]

I apologize. They did the same thing to me yesterday. They just turned off the connection. It was after the session. I've got no idea why they did this. It was operating correctly before we started.

Great. . .

M: [inaudible]

Michael Baldwin: We do. Let's try a. . . command line here. . . it's called Power TCP, yep.

M: [inaudible]

Michael Baldwin: No, we don't have a booth here. You can check our Website.

M: [inaudible]

Michael Baldwin: Yes. www.dart.com is where we upload demos.

M: [inaudible]

Michael Baldwin: Visual Basic is. . . you know, I'm sold as far as being a rapid development environment. It's terrific. And the event-driven nature of how the events are built right into the environment make it extremely easy to implement event-driven products, like communication's products.

M: [inaudible]

Michael Baldwin: Oh, Version 4 is. . .

M: [inaudible]

Michael Baldwin: Well, you know, companies like ours could come up with. . . start writing Java applications. You know, it's something we could start doing.

M: [inaudible]

Michael Baldwin: Oh, no, we could, but, no, we're not.

M: [inaudible]

Michael Baldwin: Not very much. You know, Java, you know, in the building of Java applets, it's different, totally. It's a new product area for anybody doing it, really.

M: [inaudible]

Michael Baldwin: It's basically hosting independent execution, you can run an applet on any host.

M: [inaudible]

Michael Baldwin: Well, thank you very much for coming and I'll hang around if anybody wants to talk about anything in particular. . . there are [the] applications; there are [the] data and enjoy the show.

TUTORIALS

VRML AND WEBSITE — 3-D ON THE WEB



SPEAKERS

Michael Roberts

President, Vannevar New Media, Inc.

Jay Williams

Vice President, Research & Development, Serve.Net

Michael Roberts: My name is Michael Roberts and this is the VRML Tutorial. If you're in the wrong tutorial, now would be the time to go. If you're in the right one, find a seat wherever you can. I think we're a little overbooked on this flight.

My company is Vannevar New Media. We've got some cards on the tables if you need to know how to spell that and a genuine movie poster to the first person who can say what the significance of our company's name is.

M: [inaudible]

Michael Roberts: Very good. You're an academic guy, though. You cheat us.

M: [inaudible]

Michael Roberts: Yes, indeed. Vannevar Bush was... Vannevar Bush was a science advisor back in the '40's and '50's and he predicted the Internet and the WorldWide Web. In fact, you can find a hypertext version of his article from 1945, about something that he called the "Memex" and I believe it was in *Atlantic Monthly*, but if you do a search on Vannevar, you'll find that article as well as a lot of stuff that we've done.

We're here to talk about VRML, which is "Virtual Realty Modeling Language." And the idea behind VRML is to create 3-D spaces on the Web. The Web is currently two-dimensional. Basically you're looking at pages; 2-D representations of data.

The idea behind VRML was to create a protocol that would allow 3-D environments over the Web. This involves some different kind of attributes and different kinds of considerations from those involved with HTML.

M: [inaudible]

Michael Roberts: There's a chair right there.

Before we get started, I want...with the details... I want to talk about the VRML vision.

Has anybody read either *Snowcrash*, by Neal Stevenson or *Neuromancer*, by William Gibson?

These are very good... very good fictional descriptions of where VRML and the WorldWide Web ultimately are going. And where they are going is a seamless, three-dimensional, immersive environment — a computing environment in which you are there. You exist there.

Now, let me read a little bit out of *Snowcrash*. And the reason that I choose *Snowcrash* is... and in a paper by one of the VRML developers, it says right here: "Goal: The ultimate goal of VRML is to model The Black Sun in Neal Stevenson's *Snowcrash*."

So we're going to take a little visit to The Black Sun and use this as a vehicle for talking about some of the issues surrounding VRML and where it's going, okay?

“Hero,” (the protagonist of the novel who’s name happens to be Hero Protagonist) “here is approaching the street” (and it’s all written in present tense, too). “Hero is approaching the street. It is the Broadway; the Champs d’Elysee of the Mediverse. It is the brilliantly-lit boulevard that can be seen miniaturized in backward, reflected in the lenses of his goggles. It does not really exist, but right now millions of people are walking up and down.” (So we’re talking about an environment that is complete; a “Mediverse.” Not only that, it’s collaborative. There can be other people in it at the same time.)

“The dimensions of the street are fixed by a protocol. Hammered out by computer graphics, Ninja overlords of the Association for Computing Machinery’s Global Multimedia Protocol Group” (that sounds pretty scary — there is a VRML working group that is hammering out these protocols. VRML 1.0 was released this past spring). “The street seems to be a grand boulevard, going all the way around the equator of a black sphere with a radius of a bit more than 10,000 kilometers. That makes it 65,536 kilometers around, which is considerably bigger than earth. So [inaudible] environment. So millions of people roaming around in it.

“Like any place in realty, the street is subject to development. Developers can build their own, small streets feeding off the main one. They can build buildings, parks, signs as well as things that do not exist in reality, such as vast, hovering-overhead light shows, special neighborhoods where the rules of three-dimensional space/time are ignored and free combat zones, where people can go to hunt and kill each other.”

Michael Roberts: Okay, so we’re talking about “virtual reality” as opposed to “real reality” and the idea of creating something where it’s not just a duplicate of what we have here. In other words, the object of VRML is not to simply take things that are in real reality and put them on “line,” but rather to put it in an environment where people can do things and interact in a way that you can’t in the real universe. See, “where the rules of three-dimensional space/time are ignored.”

“As Hero approaches the street, he sees two young couples, probably using their parent’s computers for a double-date in the Mediverse, climbing down out of Port Zero, which is the local point of entry of the monorail stop. He is not seeing real people, of course. This is all a part of the moving illustration drawn by his computer, according to specifications, coming down the fiber-optic cable. The people are pieces of software called ‘avatars.’”

Michael Roberts: An avatar is basically your representation in the virtual space that we’re talking about. The VRML 1.0 spec doesn’t really allow for avatars. It doesn’t really allow for the collaborative environment, but that is coming. Now, a company called “Worlds Incorporated” has extended VRML in a way called “VRML Plus” and they’ve created a collaborative environment. And Mr. Jay Williams will demonstrate that a little bit later. I have to leave early today. Unfortunately, I wasn’t able to change my flight, so I’m going to be leaving at a little after 2:00 and Jay’s going to pick up. And he’s the tech guy, so please give him a break on the visuals, he knows a lot about the technical side of things.

The World’s [inaudible] allows that collaborative avatar environment, okay.

“Hero cuts straight across the street and under the monorail line, headed for a large, low-slung black building. It is extraordinarily somber for the street, like a parcel that someone forgot to develop. It’s a squat, black, pyramid with the top cut off. It has

one, single door. Since this is all imaginary, there are no regulations dictating the number of emergency exits.

“Above the door is a matte-black hemisphere about a meter in diameter, set into the front wall of the building. It is closest thing the place has to a decoration. Underneath it, in letters carved into the wall’s black substance is the name of the place: ‘The Black Sun.’”

Michael Roberts: The Black Sun is a bar and a lot of the action in the book occurs there. It’s a kind of *film noire*, kind of place — if any of you’ve watched old Bogart movies. Okay, this is The Black Sun on the Internet. You can download this file and wander through here and you can see we’re approaching that meter there. We’re using a browser called “WebSpace” and Jay’s going to explain more about the features and details of WebSpace later, but let’s take a quick tour of what we’ve got versus what the vision is.

First thing you notice is that the polygons that represent The Black Sun, are getting a little squirrely in the rendering here.

VRML currently, although it’s “Virtual Realty Modeling Language,” really [should be] Virtual Realty Rendering Language. In other words, it’s not really modeling anything; it’s simply rendering surfaces. And because those files have to be very small in order to transfer over the Internet... remember now, graphic’s files traditionally have been very large. Because those files have to be kept very small, you can’t have that many polygons. You can’t have that fine of structure on your models, so you see some things like this.

Now, we’ve got some other models. Now we’ve just gone straight through the wall of the... of The Black Sun. And this is the interior. It is extremely simple. This is a very simple model. And we’ll show you some more complex ones later, but there is the entrance, right there.

Okay, so the question is: How do we get from that vision or from here to that vision? What kind of things are missing in our virtual realty world?

Well, right now, it’s strictly visual. In other words, you’re seeing surfaces rendered. What kind of things do we need to add?

And I’d like this to be a little interactive and let people kind of... what do we need?

M: [inaudible]

Michael Roberts: We need sound.

M: [inaudible]

Michael Roberts: Some text.

M: [inaudible]

Michael Roberts: What other things basically make up reality? In other words, if you’ve got reality when you make virtual reality...

M: [inaudible]

Michael Roberts: The ability to manipulate objects. That’s an excellent one. That’s an excellent one.

M: [inaudible]

Michael Roberts: Where are you? Orientation. You've got to have a way of knowing where you are.

In the browsers there's usually a couple of different modes where you move through the space; one is this walk mode and the other is an object mode. In the walk mode, you're kind of looking at the overview of... you're kind of feeling your position in the space and in the examiner mode, you're actually going to be manipulating an object. Let's go. Yeah. And Jay will explain more about that later. But those are the two modes for orienting yourself.

But there's got to be substance. There's got to be more to this and that's where the future specifications come in. That's where VRML 1 etc., VRML 2.0 come into play. Okay, we've got to have some way of getting from our simple rendering system to a system where we can interact.

Now what kind of applications would there be for VRML? In the book it's a meeting place. It's a social gathering. It serves the same purpose that any kind of location serves in the real world. The difference is that anybody can get there, right? If you create a virtual space on the Web, anybody can get there who's on the Internet. If you create a physical building, in reality, you've got all the physical barriers to travel...to deal with and that brings up the point about virtual reality, not simply being a duplication of reality...and here's an example where I wish I was in a VRML environment right now. We want to make it better, okay.

The ultimate goal is to create a room just like this; where we can interact exactly like we are now. Where I can look into the faces of the people I'm speaking to and I can chat with them after the show and we can have an actual dialog, but I could still be sitting in my office in Houston. That's the objective. Save myself the \$400 plane ticket and the miserable ride that I'm going to have back and do it from here. Not only that, but it allows a lot more people to attend. Okay, there could be a lot more people here and I could probably do a lot more sessions.

We've got physical limitations. We've got people standing up here and they're uncomfortable and they're saying, "Oh, God, I wish I had a chair," and it's going to disrupt their concentration by the time this thing's over, because two and a half hours to stand is quite a long time. On the other hand, if you can put your goggles on and sit down in your comfortable easy chair with some nice music listening in the background while you wait for things to happen, it's much, much more convenient for you. Okay?

Now, that doesn't mean that it isn't going to be active and isn't going to be engaging, because I can do the same things in the virtual world that I can do here. You know, if I see somebody nodding off, I can say, "Wake up and pay attention to what's going on."

He's going, "He's pickin' on me."

No, it's very unfair. He's paying attention.

But the point is that the VRML environment offers a lot of promise for the future. What you're going to see here is maybe a little disappointing to those of you who are expecting The Black Sun and Hero Protagonist to go in and have sword fights, but that is coming. And the point is that it's started now. You are in at Ground Zero. It just came out in April. Okay, we're in on I.O. We are where the Web was two years ago. And just think about how the Web has exploded since 1993. And then imagine how VRML is going to explode in 1997.

M: [inaudible]

Michael Roberts: Well, first of all there...it really isn't too bad. You can get some fairly-decent models and some very low [inaudible] and let me take this opportunity to show one of the more interesting ones.

M: [inaudible]

Michael Roberts: Okay, can I dig this down here? I just want to go over to... okay. I want to go over to... this is the castle, right, yeah.

The file you're about to see is a 50K file. It imparts quite a bit of information. It's an interior of an Italian castle. On the other hand there are models out there, very nice models, some of the best models I've seen done by a company called Lightscape, that take up like 12 megabytes. The bandwidth issue is everybody's issue and not just VRML's.

M: [inaudible]

Michael Roberts: Yeah and there are a whole bunch of proposed solutions from AT&T's new system of driving ordinary phone lines up to God-knows what kind of bandwidth to fiber-optic cable to the cable companies. The cable companies are talking about set-top boxes.

So the bandwidth issue, I think, will be resolved about the same time that this converges as a useful utility. Right now, even if everyone had the bandwidth, I seriously doubt a lot of people would be using them now. Because it's not interactive yet, with the exception of the World's [inaudible]. And even that...it's kind of cool, but there are some limitations. There's some development to be done.

M: [inaudible]

Michael Roberts: Okay. There are some neat things that you can do, but as far as the average person and doing what I talked about which is using it for conferences and things like that, it's still a little ways down the road, I think, for most people.

This is the interior of an Italian castle on the Internet and it shows that... one potential use, which is educational. You could very easily imagine a representation of a museum on here and, in fact, there are some, in which a school that couldn't afford a field trip, could at the same time, at least get the feel of going through the museum. Okay, they wouldn't get the complete experience. I'm not here to tell you that VRML is going to replace your real experiences, but it's going to give them an opportunity over and above what they had. It's better than nothing. And this is an example of how that might happen.

Now, this is the "walk-through" mode, again.

M: [inaudible]

Michael Roberts: Yeah, this is a handlebar control and when I push forward, it moves me forward; when I drag to the side, it turns me. It's just like a handlebar on a bicycle.

M: [inaudible]

Michael Roberts: Yeah. This here is a "viewpoint" control, which the WebSpace browser uses and notice that when you do it, you're looking at a screen there.

When you do it, it moves you to the new viewpoint. You can control pretty set viewpoints along the way. It can be very handy for a museum kind of application.

Okay, that's an example of a "walk-through" kind of application. This was only a 50K file. Let's take a look at... let's go ahead...I think it's this one here...yeah...this is a great little educational application. How many people here have ever tried Origami? Okay, a few of you.

How many people have done Origami out of books? Okay, it's not easy, is it? Because you're trying to figure out what's happening in 3-D from a 2-D representation of it and no matter how many little, dotted lines and how many different little codes there are for moving the flaps of the paper around, you can't figure out what the thing really looks like. You're saying, "My God, I wish I just had somebody here who could show me what that model looks like."

Well, now you do. On your desktop. You've got somebody who can show you each step and what it looks like when you're going through a model... on your Origami model.

M: [inaudible]

Michael Roberts: Okay, are we there? Yeah, pick a model that's working.

Go ahead and use the world, the manipulator and kind of show how it...okay, now you can see this is the "examiner viewer." This is the other mode that I was talking about that we use as individuals when we're interacting with 3-D space. One is to move ourselves through that space and orient ourselves in the space; the other is to manipulate objects in the space that we're focused on.

Now, here's a piece of paper folded with the first fold of the model. Now, if you click on that and you can tell in VRML when you can click on something, because it lights up. There had to be some kind of way of giving you that clue and that was the way they chose. It lights up and you can click on it and it'll go to the next fold. And so you can go through each process and make sure that you're doing exactly what you're expected to do in order to achieve the result or to finish the model. And for anybody who's used the 2-D version, this is so much better... so much better for doing Origami. And there are a lot of applications like that. You know, fixing your car. They show you in the book where the thing's supposed to go, but they don't explain to you how you're supposed to get the piece through all these other things that are in the way and then try to get a screwdriver in there as well...it's really important, the 3-D relationship can be put into VRML and made available to thousands of people.

Now, modeling techniques and three-dimensional techniques have been available for PC's for a long time; the difference here is that now you can make it generally available to literally millions of people. You don't need a new kind of server. The VRML files can be served by any Web server, okay. There are a number of new browsers out there now that are freely available. So, this is something that is happening now, and the only issue is the quality of the models and the quality of the content. The technology is here, now it's up to folks like us to develop decent content that people want to see and use when they're out there.

I am gonna have to go here, shortly. I did want to take any questions regarding how VRML fits in...you know, kind of philosophically to the Web.

Yes, sir.

M: [inaudible]

Michael Roberts: There's a distinction... there are two technologies on the Mac: One is QuickTime VR and the other is QuickDraw 3-D. There is a VRML browser, based on QuickDraw 3-D for the Mac; it's called Whirlwind. Quick...

M: [inaudible]

Michael Roberts: Yeah, QuickTime VR is another technology... how many people here use Mac's?

Okay, quite a few, so this is worthwhile.

QuickTime VR is an extension of the QuickTime protocol wherein it creates the illusion of 3-D. It puts you within a shell of 2-D images. If you've ever seen those panoramas. You know, you walk into a room and there's pictures all the way around you. That's what QuickTime VR is like, except that as you get closer to the picture. It gives you another shell to look at, so it creates the illusion of a 3-D environment. It's actually very convincing. It can be quite good, but it's not true 3-D.

Yes, ma'am.

W: It's probably a stupid question, but if you have a VRML browser, does that do everything else in the Web as well?

Michael Roberts: If you have a VRML browser, does it view everything else on the Web?

The VRML browsers that are out there now are add-ons. They're helper applications or plug-ins and you'll need...

M: [inaudible]

Michael Roberts: Not at this point. I don't think any of them are independent.

M: [inaudible]

Michael Roberts: Worldview is? Okay, if you use Worldview then it would also be a Web...

M: [inaudible]

Michael Roberts: Yeah. Yes, sir?

M: [inaudible]

Michael Roberts: I don't think it'll supersede it; I think it'll be incorporated in it.

Remember what we were talking about is modeling the world as it really is. In order to do that, you've got to get beyond static pages, static worlds. Right now VRML basically describes a protocol wherein you can create a static environment. It's a scene and it's called a "scene." Okay, things don't happen in that scene without some kind of dynamic actor, some kind of action and in order to have an action, you've got to have some kind of program. You've got to have something going, cranking, and Java will probably be in there. It's wide open right now, but I suspect that Java will probably be incorporated with VRML.

Yes, Sir?

M: [inaudible]

Michael Roberts: Yes. Yeah, *Lawnmower Man*? Did anybody see *Lawnmower Man*? Okay...

M: [inaudible]

Michael Roberts: Yeah, in fact there are some experimental...and yes, definitely. The idea is that you'll have three-dimensional ways to interact with data, kind of in the same way you do now. I mean, you've got your file cabinet. You don't have to literally spread all your papers out on the floor in two dimensions and pick them up; you store them in three-dimensional environments and reference them by a three-dimensional system, which is your filing system, typically, in the physical world.

M: Is this model physical 3-D that you put in World or is that something that's just adjustable?

Michael Roberts: Let me run that...

M: What I see so far is a model of 3-D you put in perspective World; is that built into the language?

Michael Roberts: Yes.

M: Okay.

Michael Roberts: Yes.

M: So I can't go to something... a different type of geometry?

Michael Roberts: There are extensions in VRML or in...okay. He's asking about the geometry. I don't think I've ever seen one...

M: [inaudible]

Michael Roberts: Okay, they're going to look at an alternate geometry.

M: [inaudible]

Michael Roberts: Basically most stuff is based on X,Y,Z and rotations about 3 [inaudible] for 6 degrees of freedom. And you're talking about...

M: [inaudible]

Michael Roberts: Could be ignored...they could be ignored. And apparently they are in some of them. Okay.

M: [inaudible]

Michael Roberts: Okay. One more question. You had one, didn't you? Okay.
Any others? One more.

M: [inaudible]

Michael Roberts: Right, when you're viewing a scene and you're manipulating it, that's running locally and that's the whole idea, is that you download the whole model, with the exception of what's called the "WWE In-line" command, which allows you to reference another server.

Just briefly, if you're in a world and you only want to define kind of the entry point, you can reference other worlds that are out there or other scenes that are out there using this in-line command. And then when you go to that home world or you go to that initial starting point, as you get closer to the edge, it can load that in-line, so you can have sort of a seamless transition from one world into another. And that's what makes it so exciting. That's what allows the creation of this Mediverse, which can be a patchwork of everybody's VRML world or home scene, I guess you'd call it.

Okay, I am going to have to catch my flight. I really appreciate you all being here. If you have any questions or comments, you know, e-mail me. I'm in Houston, Texas, but I get out to shows a lot, so please get in touch. Thanks very much.

M: [inaudible]

Michael Roberts: Mike@vannever.com. I've got cards and I'm going to leave them up here.

Jay Williams: Also, if you have anything else that you need to get a hold of Mike about, I can give you all the necessary information. Hopefully I can answer most of the questions, so I don't think they'll be too much.

Michael Roberts: And we have some packages here. We have some packages here for you, too, so don't forget to get your packages.

Jay Williams: We have a whole suite of materials which we will be handing out. I'm going to go through what some of those materials are so they can make some sense.

Now, the amazing transfer of the mike. This is the one technology I've never been fond of.

Well, my name is Jay Williams and I'm the Vice President of Research and Development for a company called Serve.Net in Los Angeles, California and Houston, Texas; two offices. We do high-end server, home page and other technology design, mostly for the movie industry, but also for other folks.

I'm basically going to go through some of the stuff that Mike breezed through very quickly. We're going to talk a little bit about the history of VRML, then we're going to talk about the technology of VRML, looking at SGI's products running on the Indy that we're running on right here and also talk about other platforms and what the parts and pieces are that are available. I'm going to try not to fall apart. Hopefully that will work. I assume they'll come tell me if it doesn't.

In terms of history, Mike had mentioned that it's brand new and it is brand new. April really was the spec 1.0 finally agreed upon. There are a lot of parts to the specification. We're not going to go through all of them. I have a detailed copy of the specification for you in the handout materials, which we actually have enough of, I think.

VRML is a vision. Mike went through some of the visionary pieces of it. Since he's on the graphic side and I'm on the technical side, I have a little more hopeful... useful pieces of it right now. I don't need to build extremely high-end graphic pieces, but I need to get concepts across to users, so using the simple polygon model, you can actually do quite a bit and we'll see quite a few things that are going on here.

From a hardware standpoint .

M: Thank you very much, sir.

Jay Williams: Absolutely. From a hardware standpoint, our hardware has now reached a point to where we can actually do some useful rendering. And we're going to talk a little bit out "rendering" and what that means and what it is in terms of the desktop work station.

Currently there's a limitation of how many polygons you can draw. Most of these, as you'll notice, even though we're talking about them as polygons, they all show up as triangles. The reason why is the triangle, from a mathematical viewpoint, is the quickest and easiest to draw, so more complex are drawn by actually creating the triangles.

When VRML was originally thought of, by several people: Mark Pesce, who wrote this text, which is in my humble opinion, one of the better texts available on the subject, which is *Browsing and Building Cyberspace*. Also our hosts, Mecklermedia, have a new book out which I have not had a chance to review yet, *VRML in 60 Minutes*. I suspect that...yeah, there's a copy of the *60 Minute Guide to VRML*." I'm always a little nervous about those particular things, but I assume that it is fairly good. One of the people that wrote it, [Sebastian Hassenger] is really active on the mailing list and things, and so he's certainly up to speed on the information that's out there.

Mark Pesce actually decided on his own that he wanted to do this kind of thing, so he enlisted the help of a person named Tony Parisi, who is a friend of his and they put together an original browser, which they called *Labyrinth*, which was in '94. It was... is that right? My dates sometimes get confused. It's all moved so fast. I've personally been working on the Internet and doing things with the Internet for almost ten years, so in dog years that's about 100,000 years.

But as they decided and got good at doing this, it was actually shown to some other folks, [Tim Burners Lee], most importantly, who invited them to come to the International WWW Conference, the first one, and deliver a paper on the subject.

Well, as you can imagine, it was quite revolutionary to see a yellow banana on a screen and be able to click on it and go to a home page. So that's a new concept in terms of hypertext.

From that original thing, many other people got involved; people from SGI; people from OKI; people from other corporations who were interested in the technology. One of the reasons that the technology has moved so far and so fast is because the companies that are involved have a very vested, commercial interest in making the technology available. So much so that SGI was persuaded to make a huge, commercial product that it had, *Open GL*, available to the public domain. One of the things that was very hard, anytime when you're doing a specification, is to actually get the things... the code available publicly for people to share it, because it is very hard to get developers to participate and work on programs where they don't have access to the particular code that they need.

So in order for the project to be successful, they believe that they had to have open code; that everybody could see the source and understand how the products were developed.

SGI has had a product which has been very successful. You've seen the results of it in things like *Jurassic Park* and other movies that have had lots of animation and especially mapping to create like the dinosaurs, for example, in there.

Also things like *Lawnmower Man* and things like *Terminator 2*, who also used that same technology. That technology is called Open GL, Open Graphics Language. And it's used by lots of different rendering engines. It's used by lots of people for different things. The product that is involved... that it is actually marketed as is *Mentor*. I'm sorry, *Inventor*, which the text, which I have floating around here, is called *Inventor Mentor*. That's why I said that, which basically gives you an overview of *Open GL* and how the pieces and parts work, along with the *Inventor* tool kit.

When they did the *Open Inventor* subset, they included everything that they thought they would need, at least to get the spec under way. And they did a very good job of the pieces that became available. We're going to go through in a minute and talk about what it takes to make a 3-D space, in terms of lighting.

How many people here actually work in 3-D environments? Do any kind of 3-D development type of stuff?

Yeah, we're going to spend several minutes on going through what those kind of things are, because it's important to understand what it takes to make up a 3-D space, because if you really haven't thought about it, you'd be amazed at some of the things that are involved: lighting, for instance. You know, if you don't have any lights, everything appears black. And, you know, it's very hard to understand some of those concepts and we're going to see how some of them work in the browsers and how you can actually determine how the textures appears in those types of things.

So after the conference, these folks got together, including the people at SGI and they began to work on new browsers. The project was sold to SGI and they began development on *WebSpace*, which is the navigator we see here, which is the most advanced of the navigators available.

Now, the reason that when I say... when I define "advanced," I mean "advanced" in terms of features; in terms of extension ability; in terms of the integration it currently has.

Now, to make things a little more confusing, another company comes into the picture, which is known as TGS, Template Graphics Software. The reason that's important is because most of you probably don't have SGI work stations. How many people here have SGI systems?

Yeah, I suspected that. How many people are on Macs? And how many people are on PC's, NT, Windows, those kind of things? Anybody else on UNIX? Other UNIX flavors? What are they?

M: [inaudible]

Jay Williams: You name it? Okay, I'm used to that one. Solaris? Okay. All right.

Any DEC folks? Okay, good. I just want to get an idea so that I... just to check so that I can tell you which browsers are going to be available and when. I have some insights as to where they are in the development process of different platforms.

TGS has the rights to market the *WebSpace* product on every other platform except SGI, so anytime you use, for example, the Windows version, which is by the way available, the Win '95 version is also available, the 32 bit... you're going to be getting those from TGS and you're going to see their name as you drive around to some different places and things.

M: [inaudible]

Jay Williams: It's, at the moment, it's shareware. It's downloadable with a price to be announced. I don't know if they officially announced the price yet.

More importantly their in-line browser, which we'll talk about in a little bit, that is a plug-in for *Netscape*, is going to be available real soon now. I have the beta and we should be out of beta... they're racing very fast to get out of beta, so very soon.

M: Is that shareware, also?

Jay Williams: They will all have a price attached. You'll be able to download the plug-in and pay for it like you do most other things.

Seriously though, I think it won't be a huge cost as far as viewers go.

Currently *Web FX* from Paper Software is available for *Netscape* 1.X products and they're 2.0 product is in development as well. It has one small bug to be fixed. There's always one.

But bear in mind that in *Netscape 2.0*, is very, very, very, very much still in beta, for any of you who use it extensively, you will know exactly what I mean. Getting rid of cached item No. 93. That's a favorite error message these days.

But in terms of the history of the project, many other people have stepped in to do things: Tony Parisi, who is one of the original creators of the concepts of things has formed a company, Intervista Software and they market a program called *World View*. That program takes a little different approach. As we've been looking at the *WebSpace* browser, they have the joystick approach for moving through the world. And while the joystick approach is a good approach, it's not necessarily the best approach, depending upon what you're doing. The *InterVista* product, which runs...there's a UNIX version... I guess there is a UNIX version, but I haven't seen it, but it runs on Windows '95 NT and is actually shipped on the disk. There's a CD-ROM that comes with the *VRML: Browsing and Building Cyberspace*. And we'll talk about a lot of the tools that are included in there, because there are some very important tools that are included on that disk along with some models and other things. And the book actually has a tutorial that let's you create a model of the solar system, which is pretty entertaining. It actually creates a clock. It's a pretty good model. I'll talk a lot more about interactive things, because I have... Mike works a lot with NASA and different people that develop extremely intense graphics for modeling space projects and things like that and whereas you can't necessarily bring a 150 meg model out across the Net, there are a lot of things you can do with smaller models.

Anyway, so there are several other products and we'll talk about them as we go through them. Those are the viewer products.

More importantly, though, are the construction products that let you actually build things. Just to shock people, we'll go look at one of the larger sights and then I'll actually show you the code that makes it up.

For example, as we were looking at it, you saw me driving around through this sight. You can see that this sight is extremely intensive. It has a whole lot of different things in it. You'll notice all of the objects inside. You can see that it consists of a whole lot of parts, both interior and exterior. We can move through the model piece by piece. This is one of the models that the people from *Lightscape* built much more extensive models than this one, but as you can see it has a ton of different objects inside of it.

If we were to go up, for instance, and say "view source," you can see that the source is pretty extensive and we'll go through what some of that is. Please note how slowly the scroll bar is moving on the right of the screen. Okay. Should you even have to attempt to write this, your arms would fall off before you were done.

So, how do we get around that? And, you know, "VRML is just a text file."

Well, yet, it's just a 10,000 line text file, so what happens is you use modeling programs to create the actual environment then you can go in and hand-code some sections of it if you want to change how some of the environmental rules work or you may find out once you've created your original model, that frequently some browsers will look at things a little bit differently and so you may want to modify some of the original settings that you used.

The good news is: You can use your traditional programs that you're used to using. If you're used to using things like *Renderman* to create 3-D objects. If you're used to using, you know, *3-D Artist* or any of the other programs that are out there that you like to use, almost all of them have either a converter available so that you can convert those models. They can export it to a particular format and you can use a converter to convert that model into a VRML. Several programs have actually gone further than that and incorporated a VRML export function into the actual program.

Two programs are included on the VRML desk. One is *Home Builder* which is a very simple program for creating space. It's job is to create walls, doors, windows and the outer

sections of things. It doesn't truly create objects, though. The other program is *Walkthrough Pro* which the program on the disk is *Walkthrough VRML*. It has a VRML export function. It can create objects. It comes with [Brutes]. You can actually see a small representation of a character very similar to Brutes. Brutes is a human object. And you can see an example of Brutes there. It's very similar to that.

Now, as we were mentioning earlier, many of these objects and some of the interactive pieces that you can do, is create links. As you see when these different things light up and we've been going through, you can make actual hypertext links to objects.

With the things that we're talking about, you're going to hear me say, "In the *VRML 1.1* spec," which is actually under discussion and things are going on now and I'll show you some pointers to the places where you can go find out information and, in fact, I've included several papers from the working group on *VRML 1.1* that talk about the important things that everybody listed when Mike asked for things earlier: audio, manipulative objects. In fact, I'd like to take just a second and answer a question that was asked earlier about the relationship of Java to VRML.

I heard the same comment out on the floor yesterday. Somebody said, "VRML? Oh, yeah, Java will do that. We're just going to incorporate that."

Most people don't understand what VRML is in terms of modeling. Their view of what Java is going to do is that it's going to do still-level animation. Okay, we're going to take 30-frame pictures and we're going to use a program to flip through these 30 frames. You know, I gave up on those flip books when I was about seven, so I've got to have a little bit more... a little bit more tech involved in what I'm doing rather than just, you know, flipping through a 30-frame animation piece. And this is much, much more sophisticated. I mean, there is no comparison between what's going on here.

Please understand that what's happening on the machine that we're looking at here is it's taking a set of commands and actually re-drawing the a-polygonal shapes, the representation of the environment we're looking at here. Okay, the difference between that and a flat picture is radical and the differences between what you can do with Java combined with this technology is radical. What you can do is change the environment based upon user input. So, in other words, the more important combination of how Java and VRML are going to work together is that we could, for example, click on Brutes and he's going to turn around and ask us where we want to go

[Tape change]

Jay Williams:... to integrate with the visual drawing capabilities.

Yes, sir?

M: [inaudible]

Jay Williams: There are a lot of people who work on a lot of different things and one of the things that I'm working on is trying to make Java, *Netscape* and the viewers all behave and work and create integrated things that will use them. My company works a lot with folks in Hollywood, and so you can imagine the urgency that people have there for us to create that kind of thing to where Mickey Mouse can walk out and actually shake your hand.

M: [inaudible]

Jay Williams: I would say not far. "Not far" being defined as a couple of quarters. You know, it's one of those things that depends on time and who pays for it. You know, it's customer demand that's going to create those kinds of things. You know, I'm driven a lot by market forces and so luckily what I just described is something that I think that market wants as soon as it can get. And I see lots of opportunities, you know, for that happening. And there are a lot of really great programmers that are interested in doing those kinds of things and so with the collaboration things that have been going on, both historically and currently over the Net, I don't think it will take anywhere near as long.

If anybody had said you can get a specification now for a 3-D modeling language across the Internet in less than 12 months, and told me that 3 years ago, I'd of said you were insane, because there's no way, but because market forces are driving the growth of the Web and the growth of those technologies, you know, we can do it as fast as we want, so to speak.

Now, there are some limitations and we'll talk about some of them as we go through. One of the other limitations that things like Java will be very good for solving is the physicality or the physics problem. One of the biggest problems right now and if you go to WorldChat or any of those kind of things, you're going to find out there's a etiquette rule on WorldChat that says, "Please don't walk through someone else's avatar."

The reason for that is because there are no boundary descriptions. There's no way for your particular avatar to know another avatar is physically there. So you don't have any way to stop yourself from walking through a wall or stop yourself from walking through another person and those kind of things. That's the physics component. And just the simple lack of that, by the way, means that you can do non-Euclidean kind of things that you wouldn't normally do in a physical universe.

So we're already living in a world that's not exactly representative of that particular set of physics. So...and you'll see it happen here as we go through a wall or those kind of things. You'll see that I'm just careful to drive in the lines, so to speak. You can certainly drive outside of the lines.

So, in terms of adding that physical dimension to things, that's coming down the pike. I'm going to go through a list of what's on the immediate I.I spec that people are working on right now. Also at the top of that list is "audio." I'm a very big proponent of having to have an oral component to do the type of work we're doing. Not to mention I like to hear things, but I think it's very important for giving it some life. You know, especially moving around and looking at different worlds and areas.

So, that's pretty much the history overview, briefly, with a few technical things thrown in. Are there any questions on history? Just in general where it came from? What we're doing? Platforms? Technical things?

M: [inaudible]

Jay Williams: Oh, it's world.com. www.world.com We'll actually see it if we have time. I'm going to do that last, because that can take up a lot of time. Oh, look, there's Nicole Simpson's avatar. Yes, sir?

M: [inaudible]

Jay Williams: Not yet. It's in the discussion stage. It's been going on in multiple places now. We have a mailing list... there's a Wired-hosted mailing list where all the serious technical discussions...

M: [inaudible]

Jay Williams: Yeah, there's all that [inaudible] but it hasn't been moved over to Comp yet. It's still in the discussion stage. To get it moved over... you know how the NewsNet sometimes takes a while to get things moved around.

M: Do you know if that book is available at the show tomorrow?

Which one? *The New Riders*? You know, I didn't see *The New Riders* anywhere. Has anyone seen them anywhere around here; *The New Riders Publishing*.

Yeah, I don't think so.

M: [inaudible]

Jay Williams: Yeah, the *Pesce* book. Is it out anywhere? I haven't seen it anywhere at the show. Bookstar, Bookstop, all those places have it. It's pretty widely available... Barnes & Noble.

M: [inaudible]

Jay Williams: Yeah, I'm going to go through what they... it actually comes with a virtuous VR program for Windows and the Mac. It doesn't come with any browsers for the Mac. And we'll talk a little bit about the Mac. I think there's a lot of Mac people here, so I'll spend a few minutes talking about history of VRML and the Mac, which is a little different from the rest of the world. For a lot of reasons.

M: You mean Windows 95?

Jay Williams: I mean... some things are... any 32-bit Windows is what I'm talking about. So if you have Windows 3.1, you can actually load the 32-S stack with it and run most of the application. There are a few things... I will tell you now: It's going to misbehave horribly. Especially if you start working with an *Open Inventor* piece or something like that. It won't run... you'll...

M: [inaudible]

Jay Williams: Yeah, it's time to upgrade. There's not much... no way around it. Please get 24 meg RAM. I don't know how many times I've had to deal with people saying, "It's crashing my machine!"

Well, no, it's just slow.

M: [inaudible]

Jay Williams: Yeah, actually that's a good question.

WRL is the World format. It's a text file format. You'll see the example in the *Pesce* book that actually takes you through typing in the sections of it. So you'll actually type a model in there. I confess, I have typed almost no models other than the one that's in that text right there. Simply because it's too strenuous. And there's no reason to. With any of the modeling programs that are out there, you can model quick polygons and do things fast. One of the things were going to show you is the brand new, two weeks ago released program, *WebSpace Author*.

WebSpace Author can very quickly create all of these different things that we see here. It can actually move and reuse objects. But before we go into the authoring pieces, I want to talk about things that are available out in the Net and kind of what the conception of how things are going to work are and why VRML, not to answer the Java question again, but why VRML is very different than the things that are going on with that.

First of all VRML, like Java, is object-oriented in concept. You create objects in the virtual worlds, okay. These objects are reusable objects. For example, if you buy one of the sets or even one of the ones that are on the CD that comes with a suite of tools to do things like... that you will always use in modeling: a couch, a table, some chairs, you know, wallpaper, you know, the kinds of things that you would use for different things. Those objects, once created, can be extensible and put out on the Net. Even copyrighted, so that people could create special chairs or special different objects: cars, trucks, roads, cities, mountains, all kinds of creations. Using the things that are already contained in the spec, one of the particular pieces of the specification is what's known as *www.in-line*, which is actually an anchor, just an HTML anchor to point to another object. That object does not need to reside on your machine. That object can reside anywhere. And we're going to look at one of the repositories of objects, where all of the basic geometric shapes are already modeled there.

A lot of basic, different pieces are there. There's even some really wild pieces that are modeled out there that you can actually use, without even having to download; you just point at the other object and you can use it directly in your particular world model. You don't need to have that physical object here.

In addition, several things are being discussed. One of the things, obviously that's been very hard to get around both in HTML and VRML is the local disk problem. In other words, being able to actually, because there are so many different file system constructs, having a way to reference files on a local disk, read CD-ROM, so that you could distribute heavy-duty graphics out to a particular thing. For example, you can build almost anything with about 2,000 geometric object shapes, okay. If you had a CD-ROM containing those shapes and you were to distribute that, then loading time is insignificant. Bandwidth is insignificant. Content is everything at that point and it doesn't matter whether you retrieve the content off the Net, knowing that you have this model on your local drive.

So if you think about the ramifications of an environment like that, you can see that the opportunities for doing things, both commercially... I mean, as a designer, I think we're going to see people who's job, just like there are people today, who design particular animations or particular furniture, or particular things. There's going to be an actual virtual object design job out there. You know, I can't draw stick figures. Give me a marker to draw on the board. Network diagrams are about as far as I can get, but you know, nevertheless, that doesn't mean that I can't create things like you see on the screen right there. The fact is that other people are artists and using their work and then getting paid for you using their work is going to be big business.

So, the technology is already there to do that. It's a matter of people getting involved and understanding the technology enough to actually create objects that we can use.

I want to take some application questions, so I can just get an idea kind of what people are interested in trying to use the technology for. I mean everybody decided to fill up the room for a reason, so what are some of the applications some of the people are thinking about doing with the technology?

Yes, sir?

M: Game development.

Jay Williams: Game development. That's an excellent one.

W: Industrial design.

Jay Williams: Industrial design; another one. We'll actually look at some hammers in a little bit.

M: Database interface.

Jay Williams: Database interface. We'll look at a sequel database interface in a second.

M: Training tutorials.

Jay Williams: Training tutorials for...?

M: [inaudible]

Jay Williams: Engine room, boiler representations, flow representation.

M: Virtual shopping mall.

Jay Williams: Virtual shopping mall, absolutely. Yes, ladies and gentlemen, step right up and get your objects.

M: [inaudible]

Jay Williams: That's what you're going to use those names for.

M: [inaudible]

Jay Williams: Right, it can actually do space analysis. In fact, space analysis is one of the projects that's going on for stacking ammunition, among other things. Things like that are actually going on out there as far as objects that people are doing things with.

Well, let's just take a second to look at the *WebSpace* program and then we'll come back to the author and we'll look at some of the authoring tools, because I want to use the *WebSpace* viewer to show you some of the functions that you have to think about when you are designing things.

There are multiple parts to the viewers and each of the viewers has a different... a little different way of implementing these particular things. Let's see which one we want to look at. Yeah, let's look at the castle.

The viewers themselves, basically, have several components. Obviously one of the components is just its own GUI interface where it has different parts and pieces, but even beyond that internally they have specific things that have to be built into these kind of browsers. These browsers are very different. There are basically, you know, three ways you can build a browser now and of the browsers that are available, they do different implementations, you know.

Anyway, the different kinds of browsers — there are the kind that are plug-ins and only plug-ins. In other words, will not run, stand-alone, require the browser itself to go retrieve the URL and hand it off to the actual in-line plug-in, okay. They are actually two subsets of those: one that displays the object directly in the browser, which is what *Web FX* from Paper Software

does and the plug-in from TGS will do as well; another which opens a separate window with a separate set of controls to view the actual object. You'll notice as I go back and forth from *WebSpace*, whenever I go to tell it to go to something else, I have to go back to *Netscape*, up to the "bookmarks" list and tell it to go retrieve it. That's because *WebSpace* is not a stand-alone browser. You actually have to use it in conjunction with the *Netscape* or the enhanced Mosaic browser to make it work properly.

WorldView works differently. WorldView is an independent browser. It can actually stand alone. Now, it doesn't show anything that *Netscape* does, however; it doesn't show text, it doesn't read HTML. It's reads VRML and VRML only. The advantage is you can form your own VRML list and you know, it runs on its own and there are some things it still has to do. It still has to know that you have a browser on your machine and those kind of things. Because it needs to know where to hand things off. Just like *Netscape* needs to know where it's helper application's are as it goes around.

Now, the third type of application doesn't exist except in alpha at the moment, and that's the be-all, end-all, Hi-I'm- everything application which incorporates both the browsing functions for HTML, VRML, for DBML for everything else under the sun.

How many people have heard of DBML?

M: [inaudible]

Jay Williams: Do you know what that is?

M: [inaudible]

Jay Williams: The first time I heard of it was at the Oracle presentation. If you looked at their slide, it was up on the wall. They went through this list: HTTP and HTML and they had DBML and nobody said a word about it. I am assuming that it's Database Modeling Language, but I haven't seen it yet, so I was just curious. I keep waiting for somebody to pop up and tell me what it is so I'll know. But I'm sure it's on the way and I'm sure there are several others. In fact, one of the papers that's in your thing, lists... because we've been having so many discussions and you can imagine the philosophy discussions that go on in Virtual Reality Modeling Language, you know, people come up and say, "Well, we really have to get the old factory smell involved in this."

And they're like, "Guys, look, we're not gonna get there...let's concentrate on, you know, what we've got going right now. We have enough problems as it is with audio."

And people come up with these series of acronyms of what they want to see and we'll go through a few of them just so you can hear them now, so you can say, "Well, I heard those first before they were officially adopted into the specification."

What you see in the browser are a lot of different things that are very important for 3-D space. Planes, okay, flat surfaces are absolutely critical, because they define things like floors, ceilings, et cetera. Clay Graham, one of the virtual architects — and we'll look at one of his sites — one of the first things that he developed that was interactive, was he has a room which is — and he's an employee of SGI — he has a room where the floor rises and falls along with SGI's stock, so he'd go visit the room. You can actually figure out how close you are to the floor or the ceiling. Obviously that's a use of planes to communicate a particular concept.

I'm going to show you another book that's very important. Computer guys are known to not read anything, but hard, technical manuals, but a few of us actually read other things. This book is called *Computer as Theater*, it's by Brenda Laurel. And now it features post-virtual

reality, as an extra chapter in the paperback edition. You no longer have to buy the hard, expensive \$70.00 hardback.

This book is an excellent...in fact, it is the best description of what it takes for us to visualize the things that we do in this world on a stage, which is basically what we're doing here. Okay, what we're doing is we're trying to create concepts both that exist in reality and that don't exist in reality and translate them to a stage. That's what the planes are for. The planes on this are designed so that we have a sense of space and place, okay.

The other thing that's absolutely critical is light. You'll see that there are some windows up on the side of this hallway here and you can see that the light is coming through those windows. That gives you a sense of direction. That gives you a sense of depth. That adds to the entire fact of being able to move and the fact that changes as we move, in terms of the light. Now, you will not see a change while I'm in motion, but when I stop, you'll see a change.

Now, there are two reasons for that: One, in interface design for anybody that's worked on that, you always know there are sacrifices to be made. Nothing can ever be as you would like it to be as far as design. Why? Because you're designing for multiple platforms. You can't tell necessarily the speed on the other end. You can't tell the necessary components, etc., etc. So, you have to design to the least common denominator in terms of being able to deliver.

One of the decisions was made in the creation of *WebSpace*, and there's been some consideration given in the actual specification, to the way the environment appears. There are two choices in terms of how you have your environment appear: Choice Number one is that when you're moving, you can have it all move to wire frame. All these objects that you see are made up of a collection of points. All polygons; all triangles are formed with lines to connecting points. So in any basic, 3-D model, the first thing you start out with is three points, okay. We'll get to there... there can be semantic arguments about how many points you're supposed to start with, but we'll say three. Because I don't think you can make a valid object with less than three points.

Basically, those three points are actually used to combine together to make everything else. Whenever you have a wire-frame drawing, and we'll see some examples... the floor, for example, is close to a wire-frame drawing... you basically see none of the shading; none of the texture; nothing except the points in the lines. That speeds up the drawing capability of the browser, so that you can quickly move from point to point. Okay, and we'll see some examples of that.

In this particular browser, they elected to go for maintaining the shading, slowing down the browser, but creating the effect that you're moving forward. What they decided not to do is the second thing that comes after the points and the wire frame, the textures. They fixed the textures and they don't change any of the textures. Every object that you create with three points... how many sides does it have? Two, right? Two sides is still a two-dimensional object. And you have two sides with three points, so, yeah, this is one of those chances where you could really break out that old high school trig book. It's sometimes useful in this. I get lost quite frequently in trying to figure out exactly the different places that we're going things.

But, you have two sides. And you can decide, in terms of your artistry, of coloring one or both sides. Either coloring them by flat objects or coloring them by textured objects. Okay, and we'll talk about the different file formats that you can use for textures and things like that.

How am I doing? Am I going to fast? Doing okay?

M: [inaudible]

Jay Williams: Good. All right. I have a tendency to go too fast, so if I start running off and leaving anybody, just stand up and yell. And if you have questions about what I'm talking about as I go,

stick your hand up and as soon as I get to a point to where I can answer it, I will or try to answer it.

So, what they decided to do was once the motion has stopped, they redraw the screen. They recast the lighting, which is actually a process of how the texture appears.

One of the most important things in creating your 3-D models after you've decided what the objects are going to be and where they're going to go in the frame, is to determine where the viewer's position is going to be. In other words, where the person who's seeing the object is going to approach the object from and then where the object is going to be lighted from. Okay, for example, you get a very different image if you have a back-lit object than if you have an light source behind the viewer's head. So cameras angles, the type of light cast by the camera; all of those things are very critical to how the scene is displayed.

So in all of the development tools and in all of the browsers, you'll see all different kinds of things to allow you to look at things from different perspectives.

One of the things in *WebSpace* is viewpoints. I suspect that viewpoints will be incorporated into the I.I of the spec; that is a speculation, it's not decided on for sure, but they're so handy for creating things like tours of an environment. So you, as the author of a site, can actually specify what you think the optimum viewpoints for your objects, for your actual worlds, are.

So what you're seeing down in this small tube at the bottom is all of the different sites that you can go to. By me clicking on this, it moves me to a particular section. Now, if your Italian is very good, you can actually read what these particular ones are, however since my Italian is nonexistent, I have to just guess.

Now, we come to this big, white space in the middle and everybody goes, "Oops, the screen's not redrawing."

Actually, the screen is redrawing. Most of the sites you're going to see are experimental sites. They're demo sites, either from a particular university; for a particular corporation; for somebody to do something. What you're actually seeing in the middle is the 3-D representation of white space, hanging in the middle of this castle. Because what you'll see is, as we move around this object... and we're going to translate ourselves to the side...and let's spend a minute and talk about controls, actually.

In this particular viewer, you have multiple controls. The joystick control controls basically motion in terms of forward, backwards, left, right. Okay, the small control on the side, right here, controls our up and down viewing; to look up; to look down; to get it centered again. It's not always easy.

This controls left/right translation and our levitational abilities, so that we can actually levitate ourselves above the scene or take ourselves down below the scene, okay. In this case, we'll move up a little bit. So you can have great sound effects, right? Yeah, we're working on audio, I'm telling you. That's what I do now. My friends come by when I'm working on all this stuff and they're like, "What are you doing, man?"

"I've got to provide the sound effects. They don't have any."

Seriously, though, we're going to move around the side of the object and the further I move away, the faster I'm going to move around the side of the object. And you're going to notice that what we have now is actually a 3-D object. Sometimes working this joystick is a real joy.

But what you can see is the actual 3-D outlines of the object to show you that there is something out in space.

The other things obviously would be that if you fly up to the window up there, this is known as the "fly control," and in fact in *WorldView* it's called "fly". *WorldView* uses the small picture on the right for all of its controls, rather than having the joystick control, so you actually

have... much like you have in the 3-D modeling program, you actually have a control pad viewpoint, rather than a joystick viewpoint. I sometimes get confused if I've got to pull back and turn to the left and the joystick, when I want to fly backwards, and you know. If I were a Nintendo controller, I'd be in good shape. Those are coming, by the way. The alternate input controller section is part of the I.I discussion at the moment. Whether or not everybody's going to agree on which plug we're going to plug into is the usual discussion.

"Use the joystick port."

"No, let's use the parallel port"

"No, use the zero port. I like the zero port better."

"Let's make a new port."

I mean, that's just... I stay out of that. Just tell me what you want to do with the hardware, guys.

Seriously though, as you can see, you can actually navigate around fairly well using these different things.

The other two objects that you see over here: One, this allows me to pick a particular point and say, "Hey, gosh, what's outside that window?"

And say, "Take me there now, you. Don't argue with me."

It won't let me fly up that high. It only let's me translate to things that are on my level. This is the old version. This the beta version that we're running here, I forgot. The actual released version will let you fly up from clicking on that, to go look at doors and those kinds of things.

The concept that allows us to do things like changing the lighting as we move and changing the objects and things that we move, is what's called "level of detail" or "LOD," for short. You see lots of LOD discussions going on.

LOD discussion involves what's going to happen when you reach a certain point. For example, as I'm standing back this far from a particular person, I can see that somebody has hair; they have a nose; they have eyes; they have all those kinds of things, but, until I get up really close, I can't tell what they're eyes look like or what their hair looks like. And because... when I'm this far away I don't need to know, right? Well, maybe I need to know, but if I need to know, I'll get closer. So the fact is that you're going to see lots of objects off in the distance. Also you have all kinds of issues with screen clutter, redraw capabilities, you know, all of those kinds of things. As you get away from an object, in fact if it's behind you, who cares if it's being redrawn, right? You can't see it. And so this also gets into some of the Euclidean discussions about whether or not we assume humans have four eyes, three eyes, two eyes or whether or not we're going to allow, you know, Sensaround sound.

If you look at the avatars in WorldChat, you'll actually see several aliens there. One of them has one eye. I'm like, "Hey, how come he has depth [inaudible]." I don't think they were happy when I pointed that out to them, but anyway. They have a fish. I'm like "What? Are you going to turn sideways to see everybody?"

So those kind of things obviously haven't come into play yet, but they will. I can guarantee it. Especially the game manufacturer's viewpoint. I guarantee you they're going to be critical. I mean, the ability to actually see all the games...I mean, this is hilarious. How many games are there out there that have aliens in them? Tons, right? They all see like humans. I'm like, "What's the use of that?"

If I want it to be an alien, I want it to be different. Anyway...

This gives us the ability to do that, using the level of detail things you can actually redefine, you know, the views that you can see, so you could actually limit those things. It hasn't been done yet. You're going to hear me talk, by the way, about a lot of things that haven't been

done yet. I only have five fingers on each hand; yeah, I'm human. Five fingers on each hand; four fingers and a thumb. But you know, typing and putting the things into place is very hard.

Are there questions on the capabilities of the browsers in terms of VRML? In terms of what they can display.

I could go into great detail about cameras and level of detail and all those things, but it's very complex, if you don't have at least some of the 3-D background. There's a fairly decent primer in the book right there. There are very, very good books out there on all kinds of 3-D modeling. If you haven't ever played with a 3-D modeling program and you're even vaguely thinking about doing this, you're going to have to sit down and do one of two things: find your friend who's the great 3-D modeler and you've got the concepts or sit down and do some of the modeling yourself. You should probably do Number Two, whether you're going to go get someone else to help you do the actual graphics design or not.

Yes, sir?

M: Do most of the browsers [inaudible]

Jay Williams: Yes, well let me address the Windows '95 problem with browsers.

Most of the browsers and all the pieces were originally developed in UNIX systems. GZIP, of course, is a standard feature of most of the UNIX systems. It's also a multi-threaded environment, so that it knows how to walk and chew gum at the same time.

Windows '95 is working on walking and working on finding some gum. And so as it gets closer to that stage where it can actually do both at the same time, you get around that problem. There's a way to make it work. You have to mess with some of the files, so that Windows knows particularly where GZIP is all the time, and then you know, your actual browsers there and it doesn't slow down the Windows' translation process a little bit to do it.

In fact, I spoke with some of the guys that are here that built two different compression packages and I explained to them the desperate need of one of their packages to do that and I suspect that if they can make the code change to it that we'll see, fairly soon, a couple of packages that will do it on the fly. WINZIP will almost do it on the fly, so we're getting very close to where they can do that.

The GZIP question is a very good one.

One of the things that we've done to make sure that the files actually come across the Net at some speed, and you'll see why when we go to one of the Palladium sites. When I go to the Paladium, one of the Lightscape sites — when you see some of the file sizes, GZIP the files. That allows us, since they are text, to get very, very good compression on the files to bring them across the net.

The work on the UNIX machine is when they bring them across the Net, it copies into a temp directory, a temporary directory where they're automatically unstuffed and accessible to the local machine.

Windows, of course, attempts to do that and it brings them over, but it doesn't have any true caching. And if you recall when Netscape originally started to do things or when, actually, Mosaic was doing things, you had to physically download the file to view it. Now, I know that's the Stone Age for a lot of people. There's probably people here that don't even remember that anymore, but you had to actually bring the file and the graphics down to your local machine to see them. That's still the case now. Cache and removal and clean up is one of the things that's probably not going to be in 1.1; we'll probably have to wait for 2.0, because of a lot of technical issues again with the file system kind of things to make sure that it cleans up after itself, so that after you're through viewing some of these virtual worlds, it gets rid of the files.

So, if you're using this on a Windows machine, particularly you have to watch your temp directory very closely, because it will fill up very, very, very fast as you're driving through all these different worlds. That's a good-news, bad-news situation. That's the bad news. The good news is: You have all the models for you to view. They don't go away, so if you want to go back and open up another model, you can. It's no problem.

We're going to move to a different model.

On the Mac side of the fence you have to download the models. There's no caching. Let's talk about the Mac for just a second.

The Macintosh has been approaching the 3-D environment for a long time. It has some of the best rendering tools. It has some of the best graphic capabilities of anyone that's participating in the industry. They have Macintosh...or Apple has two strategies that they're pursuing that are somewhat confusing and Mike explained a little bit about them and I'll explain a little bit in more detail.

QuickTime VR is a photographic reproduction or animated reproduction space. That's its job. Its job is to take either existing photographs — you can get your professional photographer with a 105mm lens and some very precise gear and send him out to photograph an environment and you can use various tools that are available for QuickTime VR and recreate that environment in 3-D. It's not really 3-D; it's pseudo-3-D. It's 2-D, you know, without the glasses, so to speak.

There are tools, by the way, where you can create 3-D worlds where you have to use the glasses, too. That's why somebody came in yesterday and says, "Hey, this isn't 3-D. It's still 2-D"

I go, "I got some glasses here."

Anyway, the second thing that they have going on is QuickTime 3-D, okay? To my mind, 3-D is the more interesting of the two technologies. I mean QuickTime VR is very nice and you can see The Enterprise and walk around the bridge, punch buttons and all that, but in QuickTime 3-D you can actually take objects and give them properties.

Now, their format is known as 3-D MF, 3-D Model Format, and it creates all kinds of objects and does all kinds of things. The current viewer that's available for that, other than their simple viewer, is one that's called *Whirlwind*, which is now in 1.0 Delta 5 is the version number of the product and it's been making really good strides. It can read some VRML files.

Now, you say, "Gee Jay, there's a specification out there; what do you mean it can read some VRML files?"

Well, yes there's a specification; however, remember I mentioned earlier that different programs output different kinds of files into the VRML format. The father of all of these things was the *Inventor* language with Open GL. The ones it can't read are the ones that were created with the *Inventor* export feature for VRML, which constitutes about 75% of the models that are available at the moment, because as you can see, this is the premiere platform that's able to do those kinds of things.

So on the Mac side of this, this bug or feature is evident by seeing a blank screen when you download a model, so if you try to go to Silicon Surf and get on Silicon Surf in 3-D mode, you will find it doesn't work. That's because all of those were generated with *Open Inventor*.

Now, he is working overtime to try and fix that particular issue. I think there's more than one person, but it's a very small company. And so I suspect that we'll see that very soon, I hope.

I also know that Apple is trying to come out with a viewer as well.

Yes, sir?

M: [inaudible]

Jay Williams: They are coming down the pike. Most of the ray-tracing companies have been so busy working on the complexities of the ray-tracing thing that now they're saying, "Gee polygons. I guess we can do that."

And so they're getting very close to where they're actually going to have some tools. I personally am not an expert on the ray-tracing field or the applications, but rumor has it on the list that some of the people are working on it; I don't know who in particular, though.

M: [inaudible]

Jay Williams: Oh, it's being talked about. I've seen it blow a couple of times. By the way, the VRML list is housed, wired and it's extremely active and it's pretty technical, so take the digest version. Let me just say that right off the bat, because it's fairly active and two, be prepared to see a bunch of stuff that looks like gibberish, you know, unless you happen to have a lot of 3-D tracing background and things.

M: [inaudible]

Jay Williams: Absolutely.

M: [inaudible]

Jay Williams: You probably won't because you'll have a code error, probably before that happens, because it would be very hard if your triangle's intersect — you say in the Origami, those are intersections of triangles and we were folding the papers right.

M: Every time I fold papers, it doesn't intersect itself.

Jay Williams: Right, and that's the same thing that occurs as VRML. You can't code it so that you're going to intersect triangles, so you're going to get a coding error, right.

M: I can't have two different objects?

Jay Williams: You can have two different objects, but they're going to merge together in a single object on the screen because you're not going to define any separators in between them, right? Unless you're going to define outline.

I mean, what you're going to do is you're going to get an overlay. It's a 2-D environment, okay. You have two triangles — you saw the sphere intersecting the pyramid?

M: No, I didn't.

Jay Williams: Okay, if we go back and you see the...

M: [inaudible]

Jay Williams: No, that's fine. It's no problem. I never mind going back. I may kill myself, but I don't mind going back.

M: [inaudible]

Jay Williams: Yeah, don't worry, I'll get there first. Let's fly down to the pyramid here. Whoa, under the pyramid! And if we go, actually, to the door — Oh, I forgot, he didn't specify views on this one. This is where the author didn't specify any views and you can see how much easier it makes traveling to the world when the author says, "I'm going to take you to the door," rather than not giving you any hint where the door is other than saying, "It's over by that pyramid somewhere."

And obviously the further you move the actual drawing, the joystick or the cursor up in front of the joystick, the faster you go and it does take some getting used to. And it's different from machine to machine.

And if you ever came to this model and you didn't know that little speck was the door, it could take you a while to find it.

But as we get closer up to the door, you'll see that that's a sphere intersecting the side of the pyramid. Actually you'll see it turn into a cone in a couple of sections, because he's experimenting with level of detail, but didn't get it quite right. Let's go inside. Overtranslation... stop that...browser out of control... okay, we're making great progress. You can actually see it now intersecting the side, so I mean you can have two triangles intersecting. You can have to pyramids intersecting. You can have anything that you can...

M: [inaudible]

Jay Williams: Correct, right.

M: [inaudible]

Jay Williams: That's handled by the engine, the rendering engine. Each browser has a rendering engine built into it. This is another difference between the browsers. Different browsers use different rendering technologies. Microsoft has acquired its own rendering technology by buying up another company, as usual, and — yeah, I'm sure I shocked everybody here — but it's a very good rendering technology and so the rendering technology for 3-D is actually built into Windows '95, so I would say you're going to be able to see the products of that very soon and VRML is probably going to be part of some of the stuff that they're going to be doing.

There are people from Microsoft on the development team for I.I., the specification.

Let's go look at a couple of sites and where to go get things: First place to start, if you're going to go look at things, is actually at vrml.wire.com.

This forum actually has all different kinds of things on it and is updated on a strange basis, but you can actually go find things. If you want to find out about the history, you can go read the whole Hypermail archive and listen to everybody's arguments over and over and over. If you want to find out about what's going on in the future, you can go to the VRML Future's Forum. And we'll go there in a little bit and look at some of the things that are under discussion. If you want to go find out what's being done and what's been done, out and about, you can go to the VRML Repository at San Diego Super Computer Center, which is one of their repositories; there are several place that are connected there. You can also see the notes from SIGGRAPH, which is very popular this year and has a lot of people discussing all different kinds of things.

Actually, Mark Pesce's going to be at Internet and E-Mail World, I think, which is coming up in a few weeks, again here in Boston. And also there's actually going to be a VRML World next spring. I don't have the specs on it yet, but it's coming from your friends at Mecklermedia.

The History of Theory section: This paper on Cyberspace defines a lot of the challenges that are out there for making things work. VRML is one part of Cyberspace. We all know there's a lot of other parts. Mark, Tony and Peter go through and define a lot more things in this paper. It's included in the handouts that we're going to give you. In fact, it's the first page in the handouts that we're going to give you.

Just so you make sure you have enough stuff on the plane and at the hotel, we've got a pretty thick package here. Everything that's in here is available on-line, so if you don't feel like carrying it around, that's great. You may have to drive around a little bit to find it. Actually Monday my home page is going to have part of this presentation up on it, so you'll be able to go to Serve.Net and check out different things. It's on my card. If you didn't get a card, I've got them up here. I can get you one.

So if you don't feel like carrying this stuff around, you don't have to. It's a very good paper. You can also join the mailing list from here as well.

We'll go to the Repository. Here's a whole discussion about everything and job posting and all that funny stuff. We'll go to example applications, because that's a really interesting part.

Just to get an idea of the kinds of things that are going on, I'm just going to scroll through the list real fast, because it's pretty long. I mean, there's a ton of stuff going on and this list grows every week. It's a big list. I won't even go through the whole thing. But it suffices to say that there are lots and lots of things.

For example, how many people have seen Feathers McGraw?
Ever seen that?

Well, we've got to see Feathers McGraw who's a penguin in disguise as the chick and, I'm sorry, we just have to go look at that one, because I feel strongly that it's important for people to see that.

We can't get from this Net — go look at this at home when you get a chance. Make sure that nobody's around to see you looking at it, but go ahead.

By the way, one thing I want you to know if we look at this OZ-VRML section, we want you to notice that among the projects undertaken is a shader technology from Microsoft Corp. and Soft Image, so you're beginning to see some of the larger corporations working on different things. I think we can get to Oz. Can we get to Oz? I hope so.

Are there questions? On browsers? Interaction with the other things?

What you can do...

Yes.

M: [inaudible]

Jay Williams: Yeah, I'm going to actually go through *Web Author*. I'm actually going to drive through *Web Author* and show you how to make a couple of model and how to fly around on a couple of things.

Ah, nice slow link.

M: [inaudible]

Jay Williams: Remember I mentioned that people are creating objects. You could actually go through the sections. You can see the interactive camera sections. You can see a mike section — lot's of different pieces that are being developed, so I'm obviously not going to drive through every one, because obviously we wouldn't get anything else done if we did. You can spend an extremely long period of time doing these.

I'm going to skip down to some of the entertainment things, assuming I have one in here...there's some really great physics stuff. Anybody that's into physics, there's some really neat things in here. You can actually go look at the Klingon Battle Cruiser.

[Tape change]

M: [inaudible]

Jay Williams: Yeah, that's Number Two. No, it's not quite that, but you'll notice where it was made. Your tax dollars at work.

M: [inaudible]

Jay Williams: Oh, absolutely, he's keeping it on his own server, too. We're not paying for that link at all, trust me. There's an X-Wing Fighter there too, but we'll skip that one for the moment.

Seriously, though, the list of objects that you can actually go into...these are all different things. I mean, you'll see that there's Meshmart...people that are creating whole different kinds of things. You can see all kinds of people that are working on musical things.

Let's go to the Virtual Lounge. How many people have been to IUMA, Internet Underground Music Archive? Okay, great. Let's go to the Virtual Lounge. Now, you'll notice that one of the features that's going on here is objects are being loaded as it can get them, okay. So, different parts will appear. Now, there are different ways you can do this. You can define this to say, "Hey, show me a wire-frame box," defining the space of the object before it comes in. So, if you're driving around the space, you won't walk through and a brick falls on top of you, right, and things like that. Or you can just have them appear as IUMA.

M: [inaudible]

Jay Williams: Say again? I'm sorry.

M: [inaudible]

Jay Williams: That's something that you can set, depending on the browser. It's set, actually, in the spec. You define it in the spec, but you can actually turn it on and off with some of the browsers. So, as an author, you can define it how you want to do it and then as a viewer, the viewer can sometimes decide to override the author. There are all different kinds of things going on here. We'll click on a couple of them.

Candy bar, anybody?

Now, notice this is taking us directly to hypertext, okay? All right? So, you can actually go get direct hypertext from the VR links. This is an example of how interactivity works now on VRML. You basically create a site, the couch, for instance. We can see it pretty close. How close would you like to see the couch? Anyway, you get the picture. Nice couch, nice table. You can actually listen to music in the speaker room. They've changed the dynamics. You notice this blocked space out here? It simply means there's nothing there. Again, they've basically not defined any more views for the particular things. We can actually go look at the stereo, all right?

Look at what highlights. You'll notice the Play actually works. It brings up a particular different song. It clicks up a random song every time you click on it so you can hear the

different ones — 6.8 meg. It'll take a while, but on this link it's been taking a while. Well, you keep working on that and we'll go drive around in *Web Author*.

Okay. We'll talk about one product, *Web Author*. Brand new. This is probably the most powerful VRML editor available. It has so many features that I can't tell you about all of them. I've spent several hours working with it and I keep finding new and nifty things. That's pretty fast. Okay, that's enough of that. It's a very exciting tune for me. You know, you get random music from there.

M: [inaudible]

Jay Williams: You're looking at it. The Sun platform is eminently ready, the NT platform is following — or the Windows '95 NT platform is following eminently after that; I suspect January. Currently, what's running — I can give you a quick rundown of what's running on what platforms. *Virtus Walk-Through Pros* is available on Windows, Windows for Work Groups, Windows '95 and Windows NT and the Macintosh —

M: [inaudible]

Jay Williams: That's *Virtus Pro*. That's *Virtus Walk-Through Pro*. Yeah, V-i-r-t-u-s. And they have down-loadable demos at www.virtus.com. — *Home Builder*, which basically builds space, is available for the Windows platform. It's included on there. I don't know their direct URL off the top of my head. It's a fairly limited product. You can only make walls and floors and windows and things like that, so there's no comparison — of the rendering programs, the *Virtus* program is the one that's available on multiple platforms and it's the one I use to do stuff. It's got a good template, good libraries, very good tutorial that comes with it. It has very good support. It's an old program. It's been around a long time, which means it works. Not that *WebSpace Author* doesn't. *WebSpace Author* does. I have not crashed this program, and I've got to tell you, with Version 1.0, that's pretty amazing. I attribute some of that to the fact that it's running on IRX.

So, there are lot of things you would expect to have in a graphics program that you can do. You can actually go through and select all objects and select different kinds of things. One of the concepts in 3-D rendering is a parent-child relationship which, if you've done a lot of things, you might be familiar with. It allows you to link objects and hierarchies of objects and groups of objects together by defining which objects relate to others and what the relationship is between those. You'll notice in the view spec that you can actually go down and do all different kinds of things. You can show links. For instance, if there are linking objects, they'll actually show up. You'll watch as I go over a particular one here, if I can find one. I know there's one here. You should be able to see it. Well, I'll find one in a minute.

You can actually show the level of detail, show in-lines, the cull volumes — let's talk about culling for just a second. Culling has to do — and there are a lot of terms here, so we have most of them in a glossary section, and various text cover a lot of them, but I'll try and define them as we go. Culling is that process of when I say, if you walk by something and it's suddenly behind you and you no longer need the object in your scene — by the way, these are called scenes, as they're putting them together — then it culls the object out of the memory, so it doesn't have to redraw it; it doesn't have to keep track of it; it doesn't have to know what's going on with it. So, with cull volumes you can set how fast to get rid of those objects in a particular thing.

Show triangle count. Let me talk about why that's important. The triangle count is going to define the size of your model, okay? Currently, a Pentium 90 with 16 megs of RAM running Windows '95 or a PowerMac 8100, 16 megs of RAM, etceteras, can reasonably display 10,000

triangles before it blows up, okay? When I say blow up, I mean CPU goes down to where it can't process any more depth, so 10,000 is the ceiling, absolute ceiling. Not middle-of-the-road ceiling, maximum ceiling. That just has to do with CPU processor time, etceteras, etceteras, etceteras. It's a technological thing. Obviously, that number's going to get bigger as processors get faster, more powerful. It's not really a function of disk space, it's not really a function of RAM, other than the physical ability to load the file in there. It all has to do with processor, in this case, because this is the mathematical function that it has to do. Obviously, the Indy and other types of machines like that can process more triangles than that. That's why they're ones that are used for 3-D rendering and authoring, so they're quite commonly used for all those things.

M: [inaudible]

Jay Williams: Say again.

M: [inaudible]

Jay Williams: There are 3,130, okay? That's why that feature's there. This is a great feature. No other development program can go count triangles that fast, I'm telling you. If you're going to be doing some serious development on this and you've got to start tomorrow, here's the solution right here. Go over to the SGI booth and fill out an order form. I'm serious, because there's literally nothing else that's as powerful with as much support. I mean, they actually have five people that can answer your questions on VRML, okay. Anybody else that's out there that has text support departments is much smaller. TGS has a very good thing for their products, but they're still rolling out into beta and into production, and their authoring tools are still at least a quarter away.

Appearances — we can go through and click on different things. There are all different kinds of pallets that are used to determine color and form of objects. In the VRML specification, you have a lot of different things you can deal with. Material is what you would expect it to be, the substance of the design, and this let's you very quickly look at the pallet and cruise through and see what your different objects and things are, and you can look at all different kinds of sections. Obviously, we can say we're looking at the glass. Well, actually, I'm looking at some tropical stuff I want to see. Obviously, it's going to alter the nature of the patterns that you can use.

This is a material editor. This let's you create all those materials that you were seeing in the other ones. So you can actually go in and say, "Yeah, you know, this Fall I really need one that looks a little different," right, and actually directly alters each of the different sections. You can go to as much detailing creation of these pallets as you would like to go. This is the advantage of SGI already having all of this rendering technology and having all of these things to build it in their browser. What they've done is taken kind of a best-of-the-best from their other tools that are available and incorporated it into their authoring program. And, I mean, I've yet to come up with something — and, again, I'm not a 3-D modeler — but other things on here I could never imagine doing. Going in and editing the color map? Not me, buddy. Get somebody else. I'll take your color. I like your color very much, thank you. Anyway, you can get the editor and, obviously, we now have a whole new sheen to our world. And you're going to see me destroy this world, as we move through it, by the way. This is the part Mike warned you about when he said, give them a break on the artistic side. We'll have a polka dot house here in a minute, if I keep this up.

This is a texture editor. Textures are things that are applied to your planes that are created with a-polygons. So, you can go through and say, "Love that, mm-mm," and you can simply say, "that's really a good one." Let's see if I can do this here...yeah, that's it, three components...wonderful...let me find this — there's another one that's really good in here. It even looks more ugly. Let's do this one, the Talouse Latrec version...so you can see, we've now given the Talouse Latrec look to our new world by re-texturing the walls. Obviously, you can have a lot of fun. I mean, I can sit here for hours and just cruise around. "Wow, look at this. Hey, buddy, look at this one. This one's great." The best is when you actually have a digitizing camera hooked up. You can take a picture of yourself and then you can have the ultimate ego image on the walls, as you become the texture of your place.

M: [inaudible]

Jay Williams: Oh, yes. You can go down and select different parts. And I'll booster the selection. I'm in the unconstrained view, which does everything. You can actually go through a front construction view, which puts everything and lines it up directly — angled views, left construction view, which looks at it from the other side. Top construction view, which looks down upon the thing, all right, so you can actually see how the layout actually works and you can actually see orthogonal, if you want to, as well.

Yes, sir.

M: [inaudible]

Jay Williams: Right, yes. The only thing that this does, above and beyond *Strata*, is — I can't even phrase it in terms of above and beyond. What it does is it's for people who aren't used to the 3-D rendering environment. It basically removes all those things from *Strata*. You can go into as much detail as *Strata* has, but, as you know, when you walk up to *Strata* and sit down, you better have a damn good idea of exactly what pieces you want to do and model, because it's very, very powerful. I mean, it takes a long time to learn how to drive *Strata*. You can sit down and click this and build images — and you'll see me build a few now.

M: [inaudible]

Jay Williams: Yes, it's more entry level, but let's call it more tailored for this purpose. *Strata*, of course, is purposeful for almost everything. This is limited in purpose, in that it generates VRML files, okay? I mean, you're not going to generate, you know, your standard *Strata* files out of this. The texture editing here is no way as powerful as *Strata*'s texture or Renderman's texture editor. So, if you're really planning on creating some serious new dimensional textures, you need to get some serious rendering, modeling program. If you're planning on using existing constructs or taking texture maps, loading them into here to use, you're looking at an authoring workbench environment, that's what this is.

M: [inaudible]

Jay Williams: We're going to go through shapes in a minute. I'm just kind of driving through the buttons, as they go across the screen. We're going to look at the objects editor in just a second, assuming I don't kill myself.

Okay. Where was I? Level of detail editor. I just wanted to show you this so you could get an idea as far as the level of detail. Notice that it triangle counts 418 in the next level of

detail. There's only three levels of detail in here — actually, there's only three — yeah, there should be another one — yeah — zero — actually. Level of detail starts at zero — hmm, I don't know if that's a bug or not...can I see the transitions from here? — not really, no. For some reason, I can't see them from here. That's because it probably doesn't have any level of detail specified for this environment — oh, I'm in top construction view. That's why. I'll go back to my unconstrained view here. Yeah, we basically don't have any levels of detail specified for this one. Again, levels of detail would be if we were defining which sections — you can go into each section and specify how many triangles we're going to show at what level of detail and what's going to be attached to that level of detail, in terms of motion.

You can see you have lots of fun and exciting editors over here. There's the Talouse Lautrec section. You can actually see that we can use the pointer tool which will change our scene size — you can actually drive around and do all kinds of fun things with this one. I'm going to slow down the SGI. Watch me. Let me change my view again. Now, obviously, what we did was we increased the size of the scene and we moved back further so you can actually see what your different pieces are. The dolly moves us in and out, right? You can see the points defining the size of the scene. Usually, when you start a scene, you lay out your original points and decide how big you want the scene to be before you place the objects, which gives you a framework. This is obviously your rotational, all right? A-h-h! They'll all fall off if you turn it upside down and shake really hard. No, that won't happen. I promise. This is too much fun. I mean, the bad news is my friends come in and see me doing this and they're like, "What are you doing? Get a job. What are you doing, man? Put that away."

These are all your different tools. Let's look at particular things. Let's say we want to set a link for a particular object. All you simply do — and this is where it really gets different from *Strata* and things like that — you won't find a link or URL function in there. Basically go through and define where you're going to go to and what you're going to link it to and whether you're linking it to a viewpoint. If you want to form those viewpoints when you move around a particular object, you can simply go in here and tell it where it's going to go or what type of link it's going to be. Obviously, if you have a whole bunch you've already done — they all appear in the menu here — it's very, very simple to connect it to a particular item. If you want to make an in-line file — that's a call to another object — this is where you do that object. It defines a sphere. It'll define the object size, so if you know you're going to get a sofa image from somewhere else, it'll show you an actual picture in here. I don't have any ready to do, so I can't show you that particular one. This, again, creates the viewpoint. You can position a camera — say we want to be over there for this particular viewpoint, and we could give it a name. Then as you go through and work through your different viewpoints, you can set links. No, I'd have to put the viewpoint in the URL, if I did it that way. You can move through the viewpoints and do different kinds of things.

Let's look at Text Modeler first. Somebody asked earlier about text. My biggest thing that I've been doing is saying, we've got to have some text in here. I want to go pick up a book and open it and see the text. Currently, when you do that, basically, the best way to do it to flip back to an actual Web page to display the text. One of my first job on applets is a page-turning, Java applet. It actually just has a book where the pages turn. Everybody says I'm archaic, but I think it's kind of fun, you know, the pages turn, etceteras. So, I'm going to have a link to some books for one of the applications we're doing that goes back to that book and actually flips the pages. So, right now, I currently have to go display that either in a Java window or in a Netscape window. But, for example, if we're working on text, like we are here, we can do whatever we like to do with the text. We can decide that we want to extrude things. We could shift the way we want to do the spacing on the text. We could say oh, yes, we're going to use solid text so give me some really fun stuff to play with so I can change the extrusion profile on the text. I can

say, oh, that font family, how ugly; I need Palatino; I really hate that; and we need some italicized text, and I actually need to rotate it a little bit. Copy...quit. And then, of course, we can come up here and do the infamous edit-paste. It's going to ask me where I want it, and we can paste the text in.

Shape Modeler? This is where you get into some really fun and exciting things, where I can really do some damage. Basically you come in and define different sections of your shapes. Let's try this one. It makes some really exciting shapes like this. Not that they make any sense, but they're really fun shapes. And obviously, you have your moving in and out capabilities, rotational capabilities. You can look at all sizes and shapes. You get the idea of the power of this just by what we're doing here. I mean, that's a shape that has never existed in anybody's mind but my own, trust me; nor will it ever probably exist in reality, nor should it ever exist in reality. Obviously, you can spline everything; you can do some pretty wild stuff when you start turning on the spline. I slowed it down a little bit. There we go. I wanted to see if we could see the actual splining effect. Come on up there. Obviously, so we can make the infamous mushroom. Splines are obviously what are required to make lots of different things, so that we invert everything, so that when we turn it over now, we see the reverse of the spline, right? And you can do all kinds of degradation to change the way it looks. You can go in and say, oh, actually, gosh, I really meant to connect this into a full polygon here. So, obviously, you can see we're altering the nature of the spline every time we do that. Turn sides off, you know; change it back and forth. Multiple objects that you can do this with.

Are there questions on this, other than, gee, Jay, can't you make this more interesting?

M: [inaudible]

Jay Williams: No. Obviously, you can go through and change and add new objects and move objects around; all of those kinds of things. Your Save As function, obviously, you see you're going to save all these in its own particular modeling format. It's read by WebSpace Author.

M: [inaudible]

Jay Williams: Which technique?

M: [inaudible]

Jay Williams: Rendering. That's called rendering. Any type of thing that you're doing where you're actually trying to take an object and model it in a particular 3-D space is usually referred to as rendering.

M: [inaudible]

Jay Williams: I'm not familiar with that. We could probably ask one of the 3-D modelers. I know we have at least one in here, right? Somebody that's worked with 3-D stuff? Is there a subtopic underneath rendering where you do splining. I think it's all just lumped under rendering, right?

M: [inaudible]

Jay Williams: We can bring our images into the particular thing. One of the things that's important about this program that, again, *Strata* doesn't have, is a polygon reduction editor. What that does is — no, it doesn't delete your polygons. What it does is figures out the most

efficient use of your polygons. So, if like me, you're a dunce and create those kinds of images like the one I just did, it doesn't really explain or use polygons in an efficient manner. This will actually go through and try and conserve surface edges and merge coordinates and get rid of the extra polygons and reduce your polygon count to make your model run faster, okay? This is a great tool, because if you can imagine what it would take for me to go in and go, "Gee, Jay, I wonder if there's more polygons than I need in that particular object?" I'd be there a long time figuring that out. And, you'll notice it has Help and says, "In-lines made with Make Tool may be unmade if you edited the unpublish load space alter file." It does give you a nice warning to let you know you can destroy everything you just did very quickly.

Again, here's the new viewpoint we created. We can move around to it. It's not very exciting. Actually, that's where we were at. There's an entry, so you can look at these from the viewpoint that you've already created. There's the entry from stairs, right. Back to B, which we didn't define very well. Make. We pretty much went through all of these, right?

Outline Viewer. Did we look at that one? Outline Viewer tell us what all we've got going on in here. This is actually an outline view of the VRML file, okay? So, it's telling us what different sections we have in there. So, you can look at separators, bindings, different pieces of the file. This is to give you an idea of the breakdown, just like if you were looking at HTML outline, you'd see HTML, section, link, page, you know, all different things. These are actually the separators and the different sections for each of the images that are in there.

M: [inaudible]

Jay Williams: Yes.

M: [inaudible]

Jay Williams: Conversion, yeah. There are conversion routines for almost all of the different things out there.

What we did now was basically move into preview mode. You'll notice that it automatically launched *WebSpace Navigator* and put us in examiner view mode so we can actually go see what our model is going to drive like. So, at this point, I can say, view-walk-viewer. Now I've got a ton of textures and everything. I've been totaling messing with this particular image, so you're going to see a lot of entertaining parts to it, and it's going to take a while to redraw, mostly because of the texture mapping I did. I used extremely intensive texture map on this.

Let's talk about texture mapping for a minute. Currently, there is no graphic specification in *VRML 1.0* for texture mapping. In other words, they don't say you have to use Type X to do that. This program uses RGB files for its texture map files, because that is an accepted standard on the SGI platform and *Open Inventor* and all the other tool sets. There is a file format defined as SF Image, which is a special file format that you can use. Most people are using JPEGs and GIF format for their texture files and image file formats. The problem with that is that the files have to have been resident in the WRL directory, as the program actually calls them for texture map. Inclusion of those things in the actual formats is going to be part of I.I., to solve that dilemma.

Yes.

M: [inaudible]

Jay Williams: You can actually define anything to point to the file. The question is whether or not the viewer is going to support it. You see, there are multiple different viewers, and so I don't think any other viewers support in that format at the moment. So far, the supported formats that I know of are RGB, JPEG, GIF and the SF Image format, which is an extremely strange image format that most things don't use. So, this viewer, for example, supports RGB in this version. So, if you're using texture and image maps and you want *WebSpace* viewers to be able to see them, they need to be in RGB format.

JPEG's and GIF's are not supported by this viewer now; however, the *WorldView* supports JPEG's and GIF's. So, how much you use textures and how you do it, that's why you'll see a lot of things that are non-textured. Also, textures add a lot of overhead to the images, especially as you saw redrawing these particular sections of things.

M: [inaudible]

Jay Williams: Yes.

M: [inaudible]

Jay Williams: There are couple on the CD-ROM that's in Pesce's book — the DOS conversion tool is in there that converts from AutoCAD, *Strata*, I think, and something else. I can't remember what else it converts from. *Calgary True Space* now has a built-in VRML export function, as well, so if you're using Calgary's product — it's a very good product, it's available on there. It's very, very powerful.

M: [inaudible]

Jay Williams: The conversion routine, you pretty much have to use a DOS conversion program, at the moment. I don't think there's a Mac conversion program. There's not one that I know of. I'm trying to think if a *Virtus* will import *Strata*. I think it will. I'm not positive. I think it'll import a *Strata* object and then you could export it to VRML out of its export function.

M: [inaudible]

Jay Williams: It has to, okay? Now, I asked somebody this — I asked exactly the same question a couple of days ago and the answer was, "Uh, I'll get back to you on that." So, if it's not in the release-X right this moment, it'll for sure be in the next release.

M: [inaudible]

Jay Williams: Not the scaled-down ones. The real *Calgary True Space* program, though, you can do — I mean, I have graphics friends that swear by it, so, I mean, I feel comfortable in their saying it's a great product, yes.

Jay Williams: If anybody else does need to leave, just yell. I'll give you the materials and you can take off.

M: [inaudible]

Jay Williams: SGI. It's on the SGI. This is running on the Indy.

M: [inaudible]

Jay Williams: TGS is doing the ports to every other platform, except the Indy. They have the rights to do things. For example, the *WebSpace Viewer* is available right this second on the TGS site for the Windows platform.

The *Navigator*, correct. The authoring platform probably won't be available till first quarter on anything other than the SGI platform, for this authoring tool. Now, there are, like I said, other authoring tools that you can use. For example, for the Mac and the PC, you can use the *Virtus Walk-Through*, VRML version or the *Pro* version, either one. *Pro* version supports the export, as well.

M: [inaudible]

Jay Williams: This is the most-powerful one to date. If you have to deliver things that are going to be the highest-quality possible with the best overall integrated development environment that you know the most of the viewer — I mean, the number one viewer is *WebSpace*, so if you want the most that people are going to be able to see — and also, what's going to happen is this is going to be updated, you know, hourly. The good news of having the SGI development team and the *Open Inventor* team contributing parts of this product is that if there are going to be new features appearing — not that other companies aren't going to be — *Web FX* and *Paper Software* are committed to making some newer features appear, as well. They don't quite have the horsepower in this marketplace as SGI does, however.

M: [inaudible]

Jay Williams: Oh, it can view them. It views the *Virtus* —

M: [inaudible]

Jay Williams: It works fine. If you use *Virtus* on the Mac to create objects — at least it has for all the objects I've created so far. You know, again, it's one of those things that it's brand spanking new, so, you know, we're talking a month and a half of development here, so...

M: [inaudible]

Jay Williams: That's what I've been doing now. In fact, I use *Virtus* on my PowerBook sitting over there that actually runs on a 520. Don't get in a hurry creating any polygonal objects on the 520, but the Power PC Card's on the way any day now, I promise.

M: [inaudible]

Jay Williams: The plug-in is going to be available from TGS. I have the beta now. It'll be in release in mere weeks.

M: [inaudible]

Jay Williams: Yeah. And it's available for 1.1 — you can run it now in *Netscape 1.12* and the *Web FX* add-in. They released their 2.0 add-in, but it has a bug, and so they took it back. And so it'll be out really, really soon again. I'm sure it's a minor thing to fix.

M: [inaudible]

Jay Williams: Sure, absolutely. I'm sorry. My tether is not very long here. Sure. Gotta go, too? Questions. I'm answering questions while I'm handing these wonderful things out.

M: [inaudible]

Jay Williams: Let's talk about it. Well, myself, it would take a lot. But, most people would probably get a lot faster. But, one of the projects that's in Mark Pesce's book is called Project 188, I think, was the final name. Project 188, which is an actual attempt to model an actual environment. There's a house — in fact, it's not very far away over here — which actually became an art house through the coincidence of having a floor and furniture shop around the corner that donated a bunch of their cast-off materials: old carpet, old stuff and everything, and they just put it on every wall, every surface available. There's black satin on one roof and there's, you know, fuzzy carpet down one wall and all these different kinds of things. In fact, if somebody's got that text there, will you look up the URL for Project 188. We can actually look at the room and go see it. And what they did was they went through — and it also has all kinds of Art Deco objects and weird objects that friends brought over and they said, oh, this looks perfect in your house. You know, like don't bring it to me.

Anyway, so they went through and they decided there were 150 objects that they'd try and model to recreate the rooms of the house. And so they went through the process, but they agreed when they did it that they were going to digitize as little as possible to save time, energy and everything else. It took a couple of months, part time, to put the project together. We'll look at what the outcome of it is. You can follow the stage-by-stage process in the text. It'll actually go piece by piece by piece, explaining how they decided to do it, what the problems they encountered were, you know, what they had to give up to get this and what they had to do to do X, Y and Z.

While we're looking up the URL, we'll look at another quick site.

Are there any other questions on author? On authoring?

M: [inaudible]

Jay Williams: Yeah, I guess I would have to say that *Virtus* is the one product I know that works. You know, my recommendations now are based upon — there are so few that are available, that it's hard to make an evaluative decision. Lots of companies — I'd say *Virtus* — you can walk out on the floor and somebody is going to tell you that their product is going to be out tomorrow and maybe their product will be better. Right now, *Virtus* will work, it will create objects and export *VRML 1.0*, so...

M: [inaudible]

Jay Williams: V-i-r-t-u-s. And both of the demos are on their site. They're also on the disk that comes with that book. At the moment, that's the most complete piece you can get that has all the basic beginning things that you need to get started is in that text.

M: [inaudible]

Jay Williams: Both. Windows, Mac and UNIX are all on that one disk.

M: [inaudible]

Jay Williams: Right. Good question. Before we drive around anymore, we'll go answer that question.

You see this VRML Futures form. Right now, there's a lot of discussion going on about where the actual spec is. Do we need to put it with the IF or do we need to keep going like we're going and work on things. How bureaucratic do we have to be? All of those questions. These folks are figuring out the answers to those questions. Not without input. One good thing about being so early in the process now is your opinion can be heard. I mean, now, being the normal meritocracy that the Net is, your opinion can also be ignored, but it can definitely be heard. You could post a list, you could talk to people on NewsGroups, you could do a lot of different things. These folks have all significantly contributed, in one way or another, to where we are today, okay? I mean, there are a ton of things going on and all these folks have created different things.

You look who's here: Gavin Bell from SGI, Brian Blau from AutoDesk, Rick Carey from SGI, John Hartenburg from OKI, Marbury from Microsoft, one of the guys from NETCOM — an academic; oh, my gosh — and several other people like Tony Parisi from Intervista, Mark Pesce and — I actually don't know who this person from Knowledge Adventures World is, but that doesn't mean — I'm sure they're important. I just don't know who they are.

These white papers — 20 August is what we're talking about here. I want everybody to keep in mind what we're talking about in terms of shortness of time that things have been going on. The VRML spec, I mean, really July was the announce date. In August, the I.I papers are coming out, okay? It's now November so, we've had three months to go through different pieces that are presented in these papers, so I.I is not very far away.

This basically goes through and talks about a lot of the different things that we had. I'm going to quickly run through one section in one of these specs, if I can find it. When these went to the printer, they got moved around, so please do not assume that the order that these are in is the order that they should be read. Check my Web site for a detailed outline, which I'll actually put up.

Let me talk about, from Tony Parisi's paper. That's the one that says VRML Proposal I.I — I.I. Proposal White Paper. He goes through and lists what the immediate tasks are in VRML I.I that they're trying to address. One, fix trouble spots and correct minor oversights.

Two, review currently-proposed extensions. There are a lot of extensions that are proposed. Some of these behavior things that we're talking about, and I'll talk a little bit about what those are in just a second.

Add useful *Inventor* constructs. That means some of the constructs — some of the ways *Inventor* is modeled and used in language, they actually want to include some more of those in the next specification, okay, to give us some more flexibility, in terms of defining the images; the way camera settings work, the type of things that we can do in the models. Add support for simple reality. Right now, complex reality is what most of the support is in there. Everything is designed assuming that you're going to make this hugely-complex polygonal model and you have to have all this lining and pieces and so you have to define all these things, you know, for creating different sections of the model. Discovery was made very quickly and early on that you could take a few polygons and do a heck of a lot with them, and so the discussion I was having earlier about having a few shapes you could combine and make other things has to do with that

simple reality piece, so that you can actually do particular things easily with small objects and create small files, rather than having the overhead of having to load everything that's in a huge file into the VRL.

Add API and behavior hooks. In programming terms, hooks are ways to link in other applications calls into the actual language so that if somebody wanted to create a specific extension — SGI, Microsoft, Netscape, anybody else — there's a variable function in here that can call to that particular function to allow more modular ability. That has to do with linking it with Java; that has to do with linking it with a lot of different applications that are out there.

Add location-independent name support. That's the issue of the file-naming structure that I was talking about. In other words, they have to be able to understand where the files are. You have to have an application-independent name support. You can't just depend on it to be in a file-naming structure that's on the SGI; you can't just depend on a file-naming structure that's used on Windows. It has to be independent of those particular environments.

Just so you'll know that the goal set here was: I recommend the following procedure. Do RFPs for each area in early September; have a I.I spec in draft on 11-1-95 — I haven't checked the site today; we'll see if we make it — and finalize by 2-1-96. Now, that's pretty fast for specs. And there's detailed explanations of each of the ones here. You know, collision hints. Web FX actually does let you use collision detection, so that you don't run into the wall and things like that. But, it's got to be written in the VRML and WebSpace doesn't even know it exists, and so if you write it for Web FX and it doesn't — you have one of those compatibility issues. And then there's a switch button that lets you cycle through things and things like that, and most of those are specified in this particular one here.

Then J.N. Hartenburg's quote : "If you're walking on thin ice, you might as well dance." So, that's his discussion of how they're developing the VRML standard. So, you can see that it's quickly putting all kinds of things into the actual specifications.

I know I went really fast, so I appreciate your putting up with me going very fast. Are there some more questions that I can answer? Yes, sir.

M: [inaudible]

Jay Williams: Right, and see one of the database front ends. What we'll do is we'll go to one. It doesn't actually function, at the moment, but it's a front end that you can actually see. I should really show you the Jerusalem City Hall model, too. If we have a minute, I will.

Now, you'll notice that it's 12.5 megabytes. That's 12.5 megabytes G-zipped. It's almost 40 meg unzipped, but it is one of the most detailed models ever done. I would show you WorldsChat, but it involves switching the machines back and forth. I urge you all — if you've got a Windows '95 platform available to you somewhere, go get WorldsChat, download it, pick your avatar and go walk around and play. You can actually go interact with other people, you get to choose whether you want to be a penguin or a one-eyed alien or yourself and wander around. Your name appears above your head, you get to have a little chat window open, you can go talk to people. I warn you that the conversations on there are different and I take no responsibility nor can I be sued legally for recommending that you visit said place.

Now that the disclaimer is gone, let me see if I can find the one I want here. By the way, somebody mentioned games. We could look at Westword, which we will, in a second. Let me see if I can find the...

M: [inaudible]

Jay Williams: Absolutely. Most of the people that are experimenting with those kinds of things are also experimenting with these kinds of things. This is a Clay Graham creation — yeah, yeah. Remember I mentioned the stock floor that moves? This is the actual creation of — the stock floor moves around, so the floor actually increases and decreases in level with the performance of the stock. It's a little lower right now, yeah. Did anybody notice that? Yeah, it is actually low. Frequently, it's been up around here. It's quite interesting. You can actually pick different views. Clay, of course, has a lot of views.

M: [inaudible]

Jay Williams: It adjusts to floor height, yeah, based upon the ticker results from the stock.

M: [inaudible]

Jay Williams: Oh, absolutely. And you can call CGIs. You can do any kind of the programmatic things that you'd like to do. In fact, one of the things that I did, I just have the little one that changes the streetlight color, depending on how many times my Web site's been hit. So, you know, I have a little space that goes in there and I have a couple of little streets, and I have a little streetlight. And the streetlight's really easy to make; three circles, a box. You know, not rocket science at all. And, you know, the streetlight color changes, you know, depending on how many hits the site's had a day, so you can just go over to the site and, you know, see how we're doing and things, you know.

M: [inaudible]

Jay Williams: I think he only updates it once a day. It has something to do with bandwidth and, you know, sending things back and forth and all those kinds of things.

M: [inaudible]

Jay Williams: The one thing that, of course, you can't do, notice, is go back and forward when you're inside, when you're moving from models back to back like this, which is a deficiency.

Oh, here's one that's created by CGI — there's actually a couple that are created by CGI. I'm going to get to the database one, I promise, but I want to actually show — notice this one. The light direction and sun position in the scene represent the real sun position in Warsaw. During the night, the city scene is limited by streetlights. Because of long nights in Poland, some people are not able to browse this scene in daylight. But, it's very interesting to show you the kind of example that you can do. I mean, travel log things — the thing at museums. Talking about going to the virtual museum. Heck, going to the virtual museum is sometimes a lot better than going to the real museum, because you can actually stand in front of the painting. Or the painting's not on loan. I tell you, I went to Rotterdam one time to see a painting and it was on loan. Boy, was I mad. Very nice, very nice representation. And, of course, you can go through the different sections. I mean, this is not complex. This wasn't even G-zipped, and this created it real time from a CGI file. I mean, it's actually rewriting the stuff from the CGI file, so you can get an idea of the kind of things that you can do. I mean, it's really amazing. When you sit down and start doing this stuff, the ideas just crank through your head, in terms of what you can do.

Other questions? This one was built with *Home Space Builder*. You can see that you can actually download the textures and see the textures on a particular thing. You'll see a lot of

different, you know, types of things out there. It looks like we're not going to be able to get across. It does happen. Let me see if Robin Hayes' Castle...

Questions? Got to be a couple more questions left. That's great. I like it when I answer them all.

This is just a quick little castle that you can slide through. See the different pieces of castle, walk through it, go up to the door. This door is obviously going to take you to a different spot, the gallery, in this case. Notice — did you see the wire frame redraw in the back as it came down? You come into the gallery, see some cool artwork they have hanging around. Nifty 3-D stuff.

Notice that this'll take us to places, right. Whoop. O-o-o-a-h. Pretty nice, huh? Notice it automatically shifted me to the examiner mode, so you can actually look at the art, move it around. Pretty neat. Notice the back function is actually working in this model. Obviously created by an SGI employee. Very nice models here. I mean, these are pretty neat. I mean, now we're getting into some real applications where new things are being created that didn't exist before or that you couldn't create, or if you could create, you couldn't see them in this kind of environment. You don't see this in your average museum. Again, you can see the use of level of detail. You don't actually get to click on it to get close enough to visualize the object. These are very fast. These are small. You see how fast these are loading. These are not stored on the machine. They're coming directly off of SGI's server. There's a tricky part of this one, you see, where it looks like it's bending, but it's actually not. It's very interesting.

There's a couple of these that they've worked on, see that? See the effect that you got of actually feeling the thing bend. It's not; it's all splined, but — it's not an interactive movement, but because of the shape of the curves, it gives you the appearance of it. Very interesting stuff here, so...

M: [inaudible]

Jay Williams: Ask again.

M: [inaudible]

Jay Williams: Right now, the *WebSpace* Browser is available on the SGI platform and on the Windows platform, okay. On the Macintosh platform, the *Whirlwind* Viewer is available, which can see some of the VRML files that have been created. I mean, I expect it to be able to see them all very soon. As far as other types of browsers, *WorldView* Browser, which was created by Tony Parisi is available on the Windows platform. It's included on the CD-ROM; the *WebSpace* is not on Mark Pesce's book, for a lot of reasons. *WebSpace*, it's on their site, though. You can actually go get it. TGS — and I guess, just to show you a few of the sites where you can go get some fun stuff, let's go look at some of those.

Virtual Maze Generator. This thing — I gotta show you this. This is another CD — ah, come on now. Don't tell me that. Try this with *Netscape 2.0*; it'll work, okay. It won't work with *Netscape*, this version I'm using. But, you can actually go to this one and it — you can actually do the user interface. You can actually specify the X and Z on the section. It'll actually go create a maze out of VRML, based upon that interactively. It's very nice.

M: [inaudible]

Jay Williams: *Web FX* for the PC. *Paper Software* is actually here. They're out on the show floor.

M: [inaudible]

Jay Williams: Yes, it's multi-user.

M: [inaudible]

Jay Williams: They're using a modified form of IRC for the chat sections of it. It's a rebuilt chat room. They may be actually using GlobalChat, actually, to tell you the truth. I think they did actually contract GlobalChat stuff. Let's see. I think we put it on *WebSpace*. Yeah.

WebSpace.sgi.com is your entry view. This is a Lightscape-created section, which — we didn't get to see any of those neat ones, but you can see them on your own. You can actually go in here to find out about all the different tools. *WebSpace Navigator*...and we'll take you in and show you all the different sections. You can actually find out all the different kinds of things — software availability, platforms it's available for. You can see the beta versions. They're coming out any second. These are the ones that are currently under development. Oh, I'm sorry. To find the particular one, you'll need to download from templates graphics software for the ones that are currently available. It's going to take us over to TGS now. *www.sd.tgs.com*. SD is their HQ. And you can actually go down and find all the things here. *Open Inventor*, by the way, for 132, is now available. It's 995 bucks, hey. I mean, we're talking some reasonably-priced software for creation of things like that.

You actually get the full *Open Inventor* suite. It's fairly robust. It's very good. So, you can find out exactly what all's in here. It goes through and discusses all the different pieces and parts that you can get. Let's see. Where's Getting *WebSpace*. They have a VRML authoring primer here; they have a bunch of sample scenes; they have a ton of stuff on-line to help you get everything up and running. They're very good. These are the planned releases, again, in more detail. Others will think about them after this is done. You can see the sections that are coming out. You can see what's available currently. SGI, Solaris, AIX, W-32 and NT and 95, okay? More fun and exciting stuff. Registration is 49 bucks. Come on, cheap. Please register.

I always encourage people to do that, because so many people don't. Obviously, there's a lot of different things you can do. Once you get on-line, you gotta go to Silicone Surf. Have you been? Anybody been? Anybody seen the 3-D version? I'm sure some people have seen the 2-D version. Gotta have a password. It's free, but you've gotta have a password. But, it's pretty neat. You notice the wire frames because of how far we are. It's telling us, hey, I'm trying to talk to the host, because I want to get him. Now you'll see it begin to build the level of detail, based upon the distance we are out. This is an interactive area. Multiple people can go here. You can post here. There are post boards. There are things you can do, see, run around, etceteras. The wire connection is slow here, but it is...we'll go ahead and drive on up while it's still drawing things for us.

Here comes the road. But, it's really good technology that allows you to do that, so you know that things are coming in those particular places and you can wait until they're done. You can actually go to the entrance...you can actually go to the gallery. Obviously, when you get up to the gallery, you going to find that there's a link there, which we'll go to, slowly. Ah, got to have a user name. I wonder if mine works. No, I think actually, I put the wrong one in. Yeah, it happens. I think they made me JW-I, actually, for some silly reason. If you can remember your password, you can go in. I can't. I have so many different registration join things running around that it gets out of control occasionally.

Obviously, the SGI site has tons of stuff and important things on there. You can find out all about different stuff. You can actually go find out about *WebSpace Author*. Let me see if they show the platforms that they're coming to on here. \$995 for *WebSpace Author*. It's going to be

on all WebForce systems, so for those of you that are WebForce users, you can actually get it as an upgrade. I don't know — I think it's a free upgrade, right? Yeah. Existing WebForce customers, free upgrade. So, in addition, if you get the Indy platform, you not only get just the WebSpace and the VRML pieces, you get all of SGI's cool Web authoring tools, which you can see out at their booth. I don't work for SGI, but they are nice, and you can do a lot of things with them. It also makes a good server.

So, other questions?

M: [inaudible]

Jay Williams: The Indy, I would say — again, that's kind of a tough question to answer. I mean, if you're on an Intel machine running, you know, Berkeley/UNIX or if you're on an Intel machine running Windows '95, it's probably seven times faster. I'd say that's about right.

Anybody else have an opinion on that? I always like to have other opinions. Pretty close, seven times? It's significantly faster, let's put it that way. The UNIX platform is going to exceed the performance of any Windows platform currently, including Windows NT.

M: [inaudible]

Jay Williams: A UNIX platform will exceed the performance of any Windows platform that currently exists, including Alpha MIPS, PowerPC, dogs, cats, hamsters, anything along those lines.

M: [inaudible]

Jay Williams: Yeah. I mean, it's an OS issue; it's not a hardware issue.

M: [inaudible]

Jay Williams: Oh, yes. It's actually hardware — it's designed to perform. When you walk up and see the video cable here, you'll understand. It uses a proprietary video connector, just so that it can deliver the kind of things — I mean, this is an \$8,000 screen that we're looking at things on here, so, you know...but it's a great screen. It's an LCD. It's probably the most expensive LCD panel you'll ever see. But they just reduced it. It was 12,000 last week. Next week, I hope they reduce it again. Then I can afford one.

Seriously, though, they're very good stuff. But you can get this kind of performance off of most other servers and, obviously, you can get a lesser panel and those kinds of things, so they're just gracious enough to let me borrow whatever equipment I like.

Other questions?

M: [inaudible]

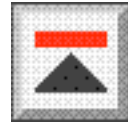
Jay Williams: Say again?

M: [inaudible]

Jay Williams: Oh, yes. Well, they have the platform.

Well, thanks for coming, everybody. We appreciate it. Does everybody have my card and such?

TUTORIAL COMMERCIAL WEB DEVELOPMENT



SPEAKERS

Chris VandenBerg

Products Manager, Microsoft Online Services, Microsoft

Michael Bauer

President, The Internet Group

Jim Sterne

President, Target Marketing

Chris VandenBerg: [Hello, I'm] Chris VandenBerg. I'm from Microsoft, and I work in the Online Services group. Jim Sterne is the President of Target Marketing, and Mike Bauer is the President of The Internet Group.

I think what we're going to do is have about a four or five hour discussion, with a break, about some of the commercial Web developments. Pretty broad topic, huh? And pretty tough to cover in that time-frame.

We've actually been doing this kind of thing together — this is the third time now, isn't it? It seems like I've been doing this forever with you guys. But I guess we've kind of followed the whole Internet path. The first time was actually in BC, about a year or year-and-a-half ago, and things have taken off since then.

I would like to think that we've stayed current. We do have some relevance, I hope. Our employers seem to think so; or, in this case, these guys are self-employed and are actually quite successful doing this all the time.

Personally, I like to make this really interactive, especially since we have, as I said, an intimate crowd. So the goal is that we're going to talk about some things, but we'd like to make it very interactive, just like the Web is supposed to be. It isn't always, but the thought's there. So if there are things that are brought up, or there are questions, we want to make this fun. I flew on a red-eye to have fun here, and that's exactly what I'm here to do, have some fun. We always try to take that approach and, please, if there are things that you want to add or that we can do to make it more fun, let's talk about it.

Hopefully we can cover all these things, because we all have presentations. There we go, that's just enough so that if we are boring, you close [your eyes] just like that. It's our job to keep you awake and keep things interesting, so as I said, we're going to talk about commercial Web development, which is a whole bunch of things.

While I'm fixing this, Jim, why don't you talk a little bit about Target Marketing.

Jim Sterne: Let's see... Target Marketing is a consultancy that helps people figure out how to use the Internet — specifically, the WWW — for marketing. I started out a couple of years back. I've been on the Internet for about four years for e-mail, and when Gopher sites started coming on, where people could go and get whatever it is they need, [I wondered] how come nobody was doing it; I started to do my research and, about halfway through, out came *Mosaic*. Suddenly that was the answer, and it was obvious that it was time to do marketing.

I went to seminars and I talked to a bunch of people and read a bunch of books, and I found nothing that talked about marketing. When I finally found enough people who could speak coherently about it, I put them in a room and put on a seminar. That was about two years ago, and that started the ball rolling. I ended up running into Chris and Mike because they were very Internet savvy, very Internet marketing savvy — Chris doing Internet marketing for the company he was working for at that time, and Michael helping Fortune 500 companies do Internet marketing from the technical perspective.

I have a book available at the Wiley Booth in the exhibition hall called *The Wide Web of Marketing*, and hopefully, by the end of the day you'll be encouraged to buy it, rather than discouraged. You'll have an hour with me to make that decision. Michael?

Michael Bauer: Hi, I'm thinking about writing a book called *How I Hate the Internet*. We've been doing this about two-and-a-half years; we started out back in 1993, and we started out working on the [inaudible] network. Now, there was a business plan for that which couldn't quite justify a business case on the first time around; we had to sell so much advertising, it wasn't clear to us exactly how we were going to do that.

We actually started trying to sell advertising, and we'd go to the people and say, "You want to take out an ad?" They'd say, "We're not sure yet. We haven't measured it — let me get back to you." Something immense was in the cost per thousand for advertising, and this was the mind-set of people placing advertising. Other than NordicTrack, of course.

Jim Sterne: Okay, so you're the only person on the Internet who hasn't made money.

Chris VandenBerg: Okay, I'm not going to sell you anything, I promise. By the way, if I do try and do that, throw a chair at me. I hate that, that's not what I'm here to do. We are here to kind of talk about some of our opinions and thoughts on things that are going on, and if you find that relevant, we're all happy. If we create controversy, that's even better — I love that. If you agree with everything we say there's something seriously wrong, because we all have different opinions.

Some of the things that we're going to cover today... I want to kind of do a level-set, because it's so easy to get caught up in all the hype and everything that's going on here that we kind of forget how it all came to pass. It's very important to understand that, because you're trying to design for the future; it's really tough to design for the future when you don't understand some of the key aspects of the past, because you really don't want to repeat the mistakes.

That's the only reason to bring those up, but we also want to talk about the fact that there are some very key opportunities going on right now in terms of access and overall better usability, which are creating the opportunity to really engage people.

The term I'm hearing now is "grab 'em by the eyeballs," It's kind of disgusting imagery, actually, but it does have relevance to what we're trying to do. I'd like to talk about some of the technology, though this is not a technical outline session. If you want to talk about which switch to turn on, it's not going to happen here, although Mike probably is the closest to being able to do that. But we're trying to say, okay, what are the potential solutions and what are the goals — that's really how I look at it — and talk about some of the security issues.

I'm going to focus on dynamic content. My personal goal for the Web is being able to address this rather nebulous concept of "narrowcasting." We're doing a whole lot of broadcasting right now, throwing a bunch of stuff up on the wall and hoping somebody likes some of it. Maybe this is not the best way to go, and maybe there are some better ways; because really the goal here, if the technology can emerge, is being able to address a market of one.

For most marketers it's very scary to think in those terms because you're trying to make it a very personalized experience, and you clearly need help from the technology. But if you can do it, the potential for success is much higher than just playing the numbers game of throwing it out there and hoping that some of those 40 million people actually are looking for what you're trying to offer.

Mike is going to talk about the whole design process. His company focuses on this and, as he referred to in some of the sites he's done, they have a huge amount of experience and they've done some very cool sites. It's interesting to watch how Mike's business has kind of mirrored the whole growth of the Internet. Clearly, they've benefited from doing some very innovative things.

I think we want to address some of these issues, to try and say, "Okay, how much does it really cost? What do you get for that? How do you make the decision in terms of whether you want to do it yourself or you want to have somebody else do it?" Because to make people buy — I'm a products manager, and I also have to evaluate how to make people buy — is it a competency that I want to bring in-house?

Now, Jim is pretty good. Jim and I have a relationship and I really enjoy listening to Jim because he brings his rules to this whole thing and makes sense out of it for me. I always learn something when I hear Jim talk about these things. I think he's going to go over these; I'm not going to in any way try to steal his thunder, but I do suggest that you follow [along closely] because Jim also can be very angry, and we want to make sure we don't make Jim mad.

At the end of the day I think we're going to talk about where we all see things going, and I hope this really stimulates a good conversation because the Web has grown so big — and all the Internet hype — and there's so many different focus areas that there's no way for anybody to kind of say, "Okay, here it is, there's a ribbon around it, away you go."

There are going to be different areas where people have different areas of expertise, and we like that. We'll always learn something from that. Hopefully it's the synergy of everybody in the room, and somebody comes away with something that they didn't come in here with. That is the goal.

I've got a bunch of strange [inaudible] the copyright law. I've given you my handouts; they are copyrighted by the owner. The lawyers make me say that and it's very valid. By the way, if you're doing this, please be very aware of copyright law. We've created some very cool tools to make theft very, very easy, and we all have to be aware of that and not use it in that manner. We still have to respect the fact that there is intellectual property and there's copyright — although, quite frankly, one of the issues is that the rules have not kept up with the technology at all. We're not going to judge that too much — I know I'm not — but that is a continuing conflict, and I'm still waiting for the precedent case to get settled where somebody actually goes to jail for really taking some other stuff.

Everybody's seen a million of these graphs. Has anybody gone to Interception during the show? So you've seen these in every session, right? You have to; it's required, they make us put these up there so that we can buy into the whole thing, too. The interesting thing, though, is that a year ago, when I got these from the Internet Society, it was only 100 million. Now in a year they've upped the projected total for the year 2000 to 124 million.

Actually, in one of the publications I was reading on the way up, [the author] was saying that it's actually going to be a billion by the year 2000. I'm not sure what Nick's smoking. This is nuts, this is ludicrous; maybe if in the year 2000, if 800 million come on that year it might make it, but let's be realistic.

The fact, though, is that all this fun traffic that we're generating, all these new applications, all these things that we're putting over this thing that we call the Internet — it's very important, if you're trying to evaluate actually doing something that is innovative, [to realize that] the Internet today is a finite resource. This is not something we talk about, ATM and all these other fun things... I've got news for you, it ain't out there yet. The reality is that there's a very finite resource called the Internet, and it's handled by MCI, Sprint, PSI, and AT&T and all these people. There's finite capacity out there.

I've chatted with Vince about some of these things. Vince is known as the father of the Internet. I don't if he even likes that or not, but he does have some great insights and opinions. [We talked about] things like the new applications, real audio — which I'll talk about later, which is also really cool — but Vince says it's also a real pain because he works for MCI, and from the standpoint of network congestion it causes serious problems.

So one of the things that we all need to be aware of, and I like to bring up in this session, is that we need to take a realistic view about the Internet.

Not that you can't use it in that respect, where you can push the envelope; just be aware that the backbone is something that you need to be concerned with. You can come up with a really cool application that does some marvelous things within your environment and maybe even on your corporate LAN; as long as you're just going to use it internally, that's a fine idea, have a good day. The point is if you then say, "This is really cool, let's share it with the world," and it needs 300 or 400 kilobits to run well, you can assume that everybody in the corporate side is going to have access to it, and some will.

But you may see serious degradation, especially at noon. I've given up trying to use the Internet between 10 o'clock in the morning — I get in at 5 a.m. Pacific time, and I do everything I need to do between five and seven, because after that it becomes unusable for almost everything I need to do. And I turn into a pumpkin at 10 o'clock at night, so I can't stay up until three in the morning, when some people do this stuff. So just be aware that there are real constraints as you're trying to design things, and look at how to use this resource.

Okay, some of the trends... I mean, this is kind of my role on this panel. I get to talk about things that they don't let me talk about at work, so it's kind of fun to look at some of the things that are happening. This is something though that I am directly affected by: the connectivity.

In the U.S. we're in great shape; all you have to do is walk out on that show floor. What's it down to — \$9.95 a month unlimited usage or something like that? You can get Internet access, really cool, and if you even want it to work, or work reliably, it'll only cost you a couple of bucks more. But normal market forces are kicking in, where you decide what kind of service you're willing to pay for. That trend, by the way, is going to be extended pretty dramatically when we actually have an infrastructure that can prioritize traffic.

One of the things you can't do today is video-conferencing over the Internet — and before somebody says CU-SeeMe, which is fine and dandy, it's a nice educational application — but try running your business on it. I'm sorry, it's not a real tool for business, and today the backbone wouldn't support it anyway. We need to be able to prioritize things.

Connectivity in the U.S. is probably two years ahead of Europe, and maybe even longer in some other parts of the world. Having said that, I think when we get to the afternoon I'm going to talk about some of the things that I've seen internationally, where they're not trying to keep that linear separation — they're trying to use this as an economic weapon, if you will, for positioning their countries much more effectively to communicate. I see them really putting in the effort to leapfrog and come on much more aggressively with widespread affordable connectivity.

Widespread connectivity in Japan — it's typically \$12 an hour, but it's widespread and you can get it in a lot of places, and it's \$12 an hour. So the two have to go together. That's certainly one of the trends that we're benefiting from here in the U.S., and it's starting to get better elsewhere as well.

The biggest thing has obviously been the tools, having something that you didn't have to say — like "[auk-/v,]" and all that gunk that people who came from the UNIX environment, like I did, were very comfortable with. That's why there were so many Ph.D.'s on the Internet; this was not an accident, because you almost had to be at that point to understand how to use the

thing. But it was designed for that, so that was okay. Certainly, the work with *Mosaic* has changed all of that, and that's probably one of the biggest things, the getting away from tools that were designed by technical people for technical people. I'll use a term of endearment a little bit later on that maybe some of you can identify with.

The interesting thing, though — and this scares the hell out of the telephone company, by the way, and I always like to do that because some of them maybe need the hell scared out of them — but the applications traditionally have been driven from the telephone company; they offer you a service, they test it, they deploy it, they make sure it scales, and they charge you five times what they should for it. And away you go.

The Internet's very different. The Internet says, "Okay, here's a transport mechanism, you come up with all these other little things on the outside and develop [as you] need applications." That's why there's so much cool stuff going on, and that's why it scares the hell out of the phone company, because for [those] two reasons they're no longer driving the applications. If they're smart they can figure out how to leverage this, because it's driving traffic across their network and that's their core resource, that's what they have as an asset. Some of them, though, are very frightened about it; they're trying to control it. They're looking at this saying, "Geez, this is not how we do business." Because the Internet says two things no longer matter: distance and volume of traffic. It doesn't matter — just sell me a flat-rate pipe.

But for me, [this is] very interesting in the U.S. I think some people are really struggling to build new business models because those two things — distance and volume — are what they've built their fundamental business models on. That's why you see a lot of the RBOCs coming up with Internet services. AT&T, MCI and Sprint have all had these things, but they're being elevated from kind of the skunkworks over on the side of the company to something very, very important. I know AT&T with John [Petrillo] has done this recently — realize that there's a fundamental shift going on, and if they don't figure it out it's going to be way too late, and they're going to be operating with the old business model and they won't compete.

[About] connectivity in general — a lot of people, as I said, build really cool applications that run great on the corporate LAN; and in some cases you can even get away with requiring ISDN, as long as you have a fallback. What 98% or 99% of the people have out there are 14.4 modems, [and that's] moving to 28.8 modems, but believe me, we've done a ton of market studies and you can't even assume a 28.8 modem.

Depending on what your goals are, if you're trying to reach the mass market you've got to assume the lowest common denominator. Just as an example, we tested MSN [the Microsoft Network] with a 9.6 modem — it's ugly, please don't use it with that. I can't use it with that. I do use it with 28.8; they offered it to me and I said, "No, I want to get a feel for how it really is with what I think is soon to be the lowest common denominator." Modem prices are coming down really quick, so make sure that you test your concept against the infrastructure that's in place — it's very important.

Otherwise, you can do some really cool work — kind of like the MIT Multimedia Lab, they do some dynamite stuff — and as long as you've got a T-1 running to your house you're going to love it all, you're really going to like it. But that's not realistic, and that's certainly not where all these people... I've seen the advertisements in *Internet World* and some of the other magazines, with the guy sitting on the Rolls Royce up there saying, "Make millions selling Internet access." I guess those are the guys that are hoping everyone gets into those applications so they can sell you the big, fat pipes. But just be aware that there are choices out there. ISDN isn't even a good assumption because the RBOCs, quite frankly, haven't got a clue on how to market this thing — it's still too hard, it's still too complicated. So just be realistic about the infrastructure is my message there.

The tools are really cool, and the big change, obviously, was getting away from requiring a lot of knowledge about the network. There's one network that's pretty much ubiquitous, and it's that little thing with the hand-set and the keypad. How often, when you pick up that phone and you start dialing, do you think, "Oh, okay, well, this goes to the central office switch, and central has a switch and they're taking the number and..." Do you care? It's transparent, it just works. That's how you know technology is mature — it's invisible.

The Internet is not there today — it's a lot closer, with point-and-click tools — but it's by no means there. It's still got a long way to go and we're going to see a lot more integration. But, using the whole point-and-click metaphor, it's taking away the requirement of actually knowing anything about it. You used to have to know where you wanted to go to start a session; that made it a nice closed little club, and all those people that knew felt so smug. But that's gone.

So really, when we went from this whole model of the "UNIXcentric," for the technical people — hey, if this is what you enjoy then have a nice day, that's fine, but that's not the mass market. The general reaction to something like this is that they can't deal with it; it's something that potentially is a problem. I think everybody really prefers this whole point-and-click architecture.

The challenge here is that if you have access and usability you have some very nice things coming together, so you can reach a lot of people and they can actually use the tools to get to some of this content that's out there. Now, the real challenge is finding what you want and making it usable. I remember about two years ago when I used to get on and read the "What's New List" in NCSA every morning. That was possible back then, there weren't 18 million entries in the thing and it was still pretty cool to see something new come up. Does anybody still do that? I actually did it for old time's sake the other day. I got back onto "What's New" and it's still there. I was really surprised that it still kind of worked.

But, clearly, now that the focus is [on the fact that] we've got this really interesting resource, and we have tons of material out there. I can buy a grave site in Finland across the Internet if I was of a mind to do so. I'm not really interested in that, but it's kind of interesting that I can do things that are that esoteric across the Net; that means most of the mainstream stuff is pretty well covered. I can buy a car, I can do a lot of other things.

Now the challenge is: can I find ways to integrate all this information in a usable form into my everyday life? Because that's a mass-market technology. If I'm just surfing around and having a good time, that's fine. I think everybody gets on — we've done studies that look at the new Internet user, and everybody's blown away for about the first three or four days, and you see people huddled up against their computer for 16 hours straight. But that wears off. Am I the only one that's kind of just burned out on that? There's times for that, but it's recreation.

The key is that I know there are some great things out there that can help me in my everyday work and home life, if I can only find them. So that really is the challenge right now — getting away from just the browsing model. A lot of different organizations and a lot of different content providers are taking different approaches. That's the nice thing, once again, about the Internet model — it's so open that a lot of people are taking different approaches. We'll see which one works because the mass market will make their choice and it will be very clear that the switching costs on the Internet are zero — it's a click away, so you'd better do a good job the first time. More on that later.

We're starting to see things like peer group alignment, where people say, "Okay, if you're interested in these types of things, try going over here." You know, Yahoo tries to break things down by categories and interest areas in some cases. From a marketing standpoint, trying to give people interest bundles based on what they've already done is a very, very interesting concept; that gets me away from just this broadcast model to at least a more focused, multi-

cast model. I can find all the people that are bicycle enthusiasts if they frequent pages that are bicycle companies. The problem is that the Internet today is not well suited to do that. You can track very clearly what a person does on your site — but what about the other 200 that they browsed? You can't do it, and that's, by the way, one of the values I think that the commercial services are trying to position [themselves as being able to do].

[There are] some really sticky privacy issues, and if we don't get into spirited discussion during that, then I'll give up. But that's one of the really tough issues that, as a content provider, you have to be very aware of, and as a user you also tend to have some strong feelings about. But the only way for somebody to find out what you like is by looking at what you do or asking you to fill out a form or something like that. They can't learn it by osmosis, and so we've got this battle with privacy versus the ability to try and find out and focus the message more clearly.

Clearly, a bunch of people are getting into trying to use this whole resource that's out there called the Internet. It's very interesting that some of the figures that I've seen are that 60% to 70% of the new Internet usage is coming from the commercial on-line services. I would like to think that part of that is because they're making it easier to use. Some generic service providers don't provide a lot of guidance, and for the technical user that's fine, that just gets in their way; but the mass market still needs some help — "Help me use this thing." It's not intuitive enough to say, "Here's a pipe, here's a browser, go nuts." It may work and it may not; it leaves a lot to chance.

I guess that the point is that the commercial service providers are trying to offer a more helpful experience — some would say maybe a managed experience. I'm not going to get hung up on the terminology, but there's a lot of growth coming from the commercial services, and right now we'll see how much of it is hype. There are some figures, by the way, on on-line services — just kind of as an aside — that we're starting to see a bunch of people that are kind of "churn" factor. They spend a free three months on one service and then they go spend three free months on another service and they just keep making the circle, and they never pay a bill. The thing, though, is that they also lose their e-mail box every time, and that's kind of a big thing to lose. That's one of the big benefits there.

Taking a look at what's been going on — and, by the way, you guys are way too quiet, so we have to change that — this is what we started out with about two years ago. I don't know how everybody else found out about *Mosaic* but I was actually reading *Info World*, I think, and Bob [Metcalf] said, just as a side note in one of his columns, "Hey, you should check out this really cool FTP site called NCSA, they've got this neat thing called *Mosaic*."

I downloaded it and it was really cool, because it was images and there was a little picture of the speaker, and I clicked on that and it took about a minute and a half to load the clip — it didn't come over too fast, but that was very different at the time. I could click on text and it took me somewhere. It seemed like from that point we had a lot of outboard viewers; you download a video clip and something else gets invoked to play that. There was a lot of proof of concept going on, and clearly, Tim [Burslee] had a very good idea. I think a lot of other people made it a reality, but *Mosaic*, from the front-end standpoint, really started the whole thing running. But without the infrastructure *Mosaic* is pretty much useless, so it was all the Web servers behind it that really added some impact to that thing. But it was still really hard.

I remember the first Web Conference, which was really a technical get-together for all the "Web-meisters." It was clearly all technical people. I came from that environment, and I can spot the technical people — I mean the extreme technical people. It's like InterOp used to be in the mid-80s, a lot of Birkenstocks with socks because it was really cold; but the point was it was really hard and difficult, and you had to have that level of expertise to make anything work.

I would like to think that we've kind of moved to maybe the next stage now, where we're trying to extend this concept. We've proved it works, [we've proved that] you can do

multimedia, you can do a lot of stuff; now what do we want to do? We've proved we can do a lot of things, so there's a ton of technology. I guess that's what I came away with from reading all the trade plugs; there's a bunch of stuff, a job is out there, real audio [is out there with] *InternetPhone*, you have MPEG, video — all this stuff is out there, which is really cool. Once again, a lot of groups are focusing on particular areas, and that's fine. There's push/pull technology, all these things, and if you're going to do design, I guess my message is this: please be clear about what your goals are first, and then drill on those technologies that you think will help you get there. Be prepared to continue to update that because this stuff is changing in real-time.

Actually, I used to have a video that showed kind of the history of the PC from 1977. I think was the first... These guys have seen it so many times that they made me stop bringing it, but it took 20 years, from '77, almost 20 years to get the PC to the tool it is today. And it's taken two years to get the Web where it is today, which is an incredible compression of product cycles. So things are changing.

The first one of these we did, people were saying, "What about security?" So people went out and solved security. What's the point? All these things are going on, so the interesting thing is that we're now focusing on trying to come up with ever-more unique content, but it's still broadcast, by and large, and it's still really hard to figure out what groups of people really want. It's also hard to change it on a dynamic basis, based on what those people like.

When I show you an ad, if I know you're a bicycle enthusiast, it would probably be nice if it were an ad for a bicycle company; [an ad for an] FTD florist maybe isn't what you're looking for at that time. But that's the power of the technology, if we could just work out some of the details. It's just code, after all. That's what we say at Microsoft — it's just software. But it's really hard software. That's the reality, and there's a lot of work going on in a lot of different places to solve the problem.

Now we're starting to get a lot of people that instead of taking their newspaper and putting it up on the Web... I think sometimes they just scanned it in, it was just ugly. Now people are saying, "This is a new media, we have to throw the old rules out. We have to try and figure out what's right for this media. We have to do new things." Maybe there's some reusable content — that's kind of a buzzword du jour in the content provider circles — but re-purpose content, I guess, is the appropriate terminology.

The point is that just re-purposing content without changing and adapting it to the new media is kind of missing the point of the new media. So unless you're just putting things like reference material up, which doesn't gain anything, if you will, from adding capabilities, you might want to look at trying to view it for the new media.

Technology is still really cool; just walk into the Sun booth and they'll tell you all about *Java* and all that stuff. But we're starting to get the idea that just broadcasting it out and hoping something sticks might not be the best way to do it. It's "sub-optimal," I guess we'd say. The goal here is — once again, when it becomes mature — is that you can just focus on the goal, you don't have to be a technical person to make it happen.

How many people in here know HTML? How many people have vowed they never will, and say, "Sorry, I refuse, I'm not doing it, it's not my job, and the tools should be smart enough to do it for me." Now, for those of you who do, that's great; I mean, clearly you're doing things today that you couldn't do if you didn't know that, and that's fine. But the tools are just not mature enough, and you still have to work really hard to do cool things.

I guess the point is that when the technology disappears, when it becomes much easier to be a designer and not an engineer, then we're going to see a real explosion, even more so than you see now — and the whole personal Web page thing is the first stage of that.

Ideally we'd like to get to the point to make a unicast message — I have some view of you, the user, and you've agreed that it's okay for me to keep that, and I can focus the material on what you find relevant and maybe let you even customize how that material gets to you. You get to have it your way, just like Burger King says.

Any disagreement? As I said, we're way too quiet. Is this nuts, am I smoking dope? I am? Okay, how come?

M: [inaudible]

Chris Vandenberg: It's still really hard to create extremely unique stuff. They tend to use a lot of templates, [the ones] that I've seen, and I try to keep up on the tools.

You're right, they've made it easier. It's not back at this first stage, where you had to code line-by-line HTML; the editors were ugly, the coding was ugly. Now people are starting to add new extensions — we won't mention any names — but while doing that we're trying to do cool things. It's not a conspiracy. Everybody's doing it, trying to add cool things, because we're trying to offer an ever-more unique experience. That's how you grab people by the eyeballs. But, in my opinion, it's still too hard; it needs to be easier to allow a designer to not have to learn the underlying language. It's kind of like making people learn assembly language to get something done on a computer.

M: [inaudible]

Chris Vandenberg: Okay, the view that the Internet is somehow a threat is personally incorrect. I work in a group where that's all we do is Internet. But from the generic, service-provider standpoint, anybody thinking that a monolithic data center model works against the Internet is nuts. You could never get all the resources and the content that the Internet has; you couldn't afford it, first of all, and there's no way that you could keep up with it. It grows exponentially. I think now all the service providers have seen that, and CompuServe and everybody's got "Internetcentric" services.

M: [inaudible]

Chris Vandenberg: You're right. I guess my point is, yes, the Internet is the thing — that's not the battle to fight. The challenge is to make it as useful as possible. It takes a lot of people; it takes software groups; it takes people creating services; it takes the telephone company scaling the backbone so that when somebody comes up with something cool it will actually run, it'll actually run during business hours. What a novel concept — from business to business.

And it's a problem right now. But I don't disagree with you at all; I think everybody is struggling to be much more Internetcentric. But certainly I can go out and find thousands of pages, and if I check the date on those pages they're probably going to be sometime in late '94 and nobody has touched them. Now, a lot of groups have changed them, but some people put it out there — it was information dissemination, and to the extent where they accomplished that, great. But did the information not change, or did we just decide that it didn't reap millions and we're not driving the Rolls Royce now? I don't know.

It's [a matter of] trying to look at what we're trying to accomplish with that, but the interactive ability initially was very limited. You chose where you were going to click, that was really your interactive ability. You could fill out a form maybe and ask for some stuff to be mailed to you, but interactive was "I want to go here and I don't want to go down here."

[Tape change]

Chris VandenBerg: ...on-line connection. I've got a wire to you with maybe a 28.8, maybe a 14.4; why don't I use that wire to give you stuff now, this second's information, however relevant that may be, and let you make that choice? I think we're starting to see more of that now, but it's a slow and painful process; and, once again, the tools are just starting to come out to allow you to do more things with the on-line, real-time connection you've got with people. It's kind of [a matter of] things meeting in the middle.

M: One of the things we're faced with in publishing is a whole paradigm shift, where people traditionally have published on paper, and it's static and it sits in the warehouse and you box it up and ship it fast, and when we want to change it two, three years down the road, we do a new addition of slides. But all of our editors' brains are feeling scrambled; they all say, "I need new data, I need new data, and I need it now, or yesterday." They can't move that fast yet. They're still having trouble rearranging the way they think about it because they're used to getting a manuscript and working on it for six months. I don't have six months, I've got six hours.

Chris VandenBerg: It changes the product cycle somewhat, doesn't it? I mean, it changes product cycles in much more than just the software industry, although the impact there has been extremely dramatic. But it changes product cycles in a lot of ancillary areas that maybe people don't think about as much. But instead of publishing the whole thing at once, maybe you have to do updates to a particular chapter, so that you're just plopping new code onto server. It's very doable as long as you can get people thinking in that mind-set.

M: That's an important point, too, because you haven't actually started to integrate all of your customers as contributors. To me that's a magnitude-of-order problem, dealing with that.

Chris VandenBerg: That's very scary to some people, too.

M: Isn't the other side the technical side, and the fact that we don't know how to technically manage them? How many times now do you go to links that are down, that are built-in? Well, once it really becomes dynamic, how do you manage all of that?

Chris VandenBerg: We're starting to see some better tools, though.

M: That actually becomes part of our problem, too, a person who's using our intellectual property. We need to have the technology on the back end and we don't have the resources to build that technology today, so we have to start with this semi-dead stuff. Everybody just banged down the door to see what book we have published this month. We don't have the resources to put this kind of technology in place to get that dynamic between ourselves and the professional student.

Chris VandenBerg: Right. That's an interesting challenge, but I think that if you're wondering what in the next six months will be one of the hot topics, then information management on the server has got to be one of them. We're starting to see a couple of products that every night, at midnight, it goes through and checks all the links and flags [to see] if something moved. Keeping track of the data in a data warehouse fashion married with the capability for

dissemination of the Web server is really what a lot of people have been talking about. It's just starting to appear.

I read about — I don't remember the name — but there was one product that actually did a structure of the links and told you where everything was, and actually did automated management of a lot of that. But I know a lot of groups are working on that on a variety of platforms, and to make it easier, so you don't have to manage it, it just kind of says, "Okay, here's where things moved," and it lets you move them into virtual server farms.

I like to pick on BofA — Bank of America — because they're actually such a good example of change. Their initial Home Page was the Golden Gate Bridge, and it had a couple of big buttons. The first one was payments; how very appropriate for BofA at the time. Then the next page — and I showed this to Jim and Mike in another session we did — was a much kinder and gentler BofA. I think they got some comments from people who said, "Yo, you might want to think a little bit about trying to be more personal; we're your customers."

The nice thing with the Web, of course, is that it's a great feedback mechanism. Please read it. Everybody who has that "Contact the Web Manager" message... I actually will do an occasional test where I'll send a little comment, maybe it's three-quarters of the time I never hear back. Either they didn't read it, or maybe they blew me off because I'm from Microsoft — that wouldn't surprise me. I mean, they're fair comments. I don't try and arouse anybody, and it's just kind of a test for me to see who reads it. With the majority I don't get comments back. So I hope everybody here does this and reads it, because people are telling you what they want, and that's huge. You would pay big bucks for that in any other situation, and they're doing it free.

So anyway, BofA has evolved their whole presence, and it's really an interesting phenomena. Now they're so customer-focused: "Build your own bank, this is all about you." Now we're starting to get into the concept here of a narrowcast, where they're saying in a very personalized approach, "Tell us something about yourself, the old traditional marketing stuff that we're trying to learn, but in a non threatening fashion." And if there's a benefit for the user, the user will make a choice whether they want to take that chance or not. But it's very interesting that they've gone through at least a half-dozen iterations, I think, of this page that I've seen. So it's been a very interesting bellwether of the evolution, if you will, of Web pages. I think they're on a very interesting track toward personalization.

I always have to show Sun because they have very cool Web pages — they do a great job. Actually, Sun is one leaders in internal Web usage, I think. They have a huge system internally for things like employee procedures and processes in terms of filing your travel reports and all this stuff that's traditional employee administration. It's all on Web servers internal to Sun — a huge amount of stuff.

They've kind of taken the approach of using Sun as an internal development environment, and then obviously pushed it out. They're doing some cool things, and they've also gotten away from being the page with the most icons on it. They held that award for about a good year, I think, hands down; they had about 40 icons at one point, and that was great. You could tell originally they did them for those nice, big Sun workstation screens.

I've got news for you; my little laptop doesn't do that, and the bottom third will always be cut off. So the message there is always test, once again, for the lowest common denominator. Take a laptop with a ratty screen and make sure what you're doing looks good and works at least in some form or fashion. If you're missing the key message... Let's say your particular marketing message is outbound marketing, and part of the page is a call to action, and you've got a button saying "Click here for our great free offer." If that button just doesn't appear on the screen, that's a bad thing. You will be sad. You need to take a look and think about those things.

We all take it for granted, especially with those screens that are 8 1/2 by 11. You get really used to seeing it like a page, and then you go out in the real world. My recommendation is please go out in the real world and see how it is.

W: [inaudible]

Chris VandenBerg: It's that lowest common denominator issue. I'll add another story from my previous employer, which had a corporate logo, and the color in that logo was a particular blue. It wasn't IBM, it was another stolid corporation. They paid a lot of money for that blue, they had it registered, and damn it, every screen in that company was going to have that blue. It's impossible, you can't do that, because each PC renders the color differently. But corporate PR just could not get over that.

Clearly there's a resetting of expectations and understanding when you start moving into these models where you're doing new things. You're not printing it on a paper where you have absolute control of how it looks. I shudder to think what their reaction would be when we say, "Okay, the front end lets the user customize it."

We used this, by the way, for a lot for recruiting, so I will say that if you're a corporation looking for good Web uses, recruiting works very well. Obviously we're a good fit because we're a software company, and the people on the Web are by and large fairly technical — although it's much more mass market now than it used to be — but then again we hire people who aren't software designers. I'm just saying that if you're in a corporate environment and you're not using the Web for recruiting and trying to draw good people, which is probably one of the hardest tasks in a growing organization today, you're missing the boat, and you should be using it for this.

Depending on what your business is, our experience has been that it works extremely well, and you get very well-qualified people. We're starting to see a lot of on-line resumés that are HTML and that do really cool things. We hire a lot of people who do really cool things in their resumés; they're slam dunk because you know that they know what they're doing. As long as you can get a feeling when you're interviewing that they really did it, that they didn't pay somebody to go out and do a good resumé — but I'd even give them points for doing that and put them in marketing, because they're product managers, and they did a make versus buy, and they bought. I can live with that. But I definitely strongly recommend you use this; it works very well for us, and also we're always hiring if you're looking for jobs.

The entertainment industry. I'll turn my sights to something that's a lot more fun. Because I kind of like *Seinfeld*, and they have really pushed — the entertainment industry in general has really pushed the envelope, in many cases, in what you can do. And maybe it's because they marry so many of the technologies; they're more into the dynamic nature of the content because of the broadcast media, whereas the print media has been static by nature and their real challenge has been, "Okay, how do we make this thing come to life for multimedia?" These guys [in entertainment] are saying, "How do we kind of de-tune it from what it does on television to grab people here, knowing the limitations of technology?" It's a completely different problem, a completely different mind-set, but they've done some creative things and they've thrown various multimedia in there, if it cooperates.

They've done this kind of thing — and I think they've done it very well — to give people a feel for what's going on and to show that they're leading the way into the new generation of multimedia and all that. You kind of expect that from broadcasting companies. I think also they're scared to death of being left behind, so they're trying to make sure that they take a very pro-active approach to this whole thing.

Actually, the movie industry has done the same thing. I don't even want to go see a movie that I don't preview somewhere, and the only problem is that I can't see enough of it to really make a decision. Everybody puts in those trailers that you see in the theater, and the movie always looks really good in those trailers, and then you get into the movie and it just doesn't live up to the trailer.

MasterCard is another one that I think has done a really good job of trying to offer value. I always bring them up because they're a good example of supplying a lot of other things that are completely unrelated to their credit card business, to kind of endear themselves to people on the Net. That's a good approach; there's nothing wrong with that. They add real value.

But the other point here is that from a very pragmatic design standpoint, it doesn't matter how much you put on your Web site. Wouldn't it be nice if a person who said, "Gee, I've found you and I've wanted to ask this question..." — and they don't want to wait for e-mail, because even if you have a very, very conscientious Webmaster that does read all those things and get them right back, there's some delay time in there. But I think what we're seeing is that now people would rather kind of say, "Hey, are you there?" and actually have someone say, "Okay, what do you want?"

The technology doesn't really allow that today. There are some things that you can do; you can use *InternetPhone* — and once again, yes, as long as it's not between 7 a.m. and 7 p.m. But it really isn't the kind of personalization. You can't cover everything somebody's going to ask — it's impossible. And right now, even if you had to give them an answer that was completely unintelligible, at least they would get an answer; but now they kind of wait for e-mail. We've seen a lot of people that ask questions that aren't in our knowledge base, and we'd love to put the entire knowledge, or the aggregate knowledge of all of our people into the knowledge base. But it's impossible, you can't do it. And that's the issue of unicast and trying to offer a more personalized view; it's an incredibly huge challenge to offer that kind of capability.

I think that the point I wanted to make by showing pages like this is that we went from fairly static pages — where people put things up and they just kind of lived there for weeks and weeks and weeks, even though things might have changed — and then we started getting into the periodical, first the monthlies and then the weeklies, and we started seeing that this was a very good way. They could change the content relatively painlessly. It may take them a couple of hours to re-publish the paper; there's a couple of problems with that and it's a basic limitation with HTML where design and content are one and the same. That's kind of a fundamental flaw, and a lot of people are working to solve the problem.

We went from this model to where we had things that were different every day, so we're starting to offer some sense of change. We've got an on-line mechanism to try and get people back, because if I see it once and I know it's not going to change I probably won't be going back unless it's some critical reference material, and I haven't found a whole lot of that in life. Life's too short and there's not enough time to do things. I do read Dilbert every morning, this has made it very easy to get my Dilbert fix. My mother is very disturbed that Pac Bell has fired Scott; that seems somehow unjust.

It's an interesting fact that now we've gotten to the point where things that do change daily are expected. It used to be a real surprise when you went to a site and then the next day it changed. Well, now, if you don't do that, forget it — you're not going to get them back. And that's the whole key — you've got to make sure you get them the first time because when you lose them, that's it.

Trying to pull a lot of things together, making the content change using some cool tools — it's all part of a very integrated approach to make it interesting and make it engaging. There's a lot going on in the technologies. I don't profess to be an expert in the technologies like *Java*

— Sun will do a much better job explaining it than I will. There are some very interesting things going on there, like the ability to actually download components potentially to do things. Some things are further along in the process than others, I will say, but the goal on all these things is user-directed — we've got a tool set and you decide what's right for you.

Push/pull technology, keeping the experience fresh, is the goal here. I mean, all of these are doing the same thing, keeping it very fresh, keeping it very immediate, so people want to see it every day because they know it's different. Some people, about six months ago, were saying, "Every time you log on we're going to change the background." I tested it a couple of times to make sure they weren't lying to me. Once again, it kind of got old after a little bit. And fundamentally, the information on the page didn't do much for me.

So technology is some nice stuff; just make sure it fits with your goals and make sure it enhances what you're trying to convey. That's really the key. Ultimately, though, what I would like to do is have some narrowcast mechanism; but if you don't know anything about me, it would be impossible for you to say, "Here's what you will like." It's going to be really difficult, and it's a huge challenge right now in the industry.

This was constantly changing for a while — the fish camera that took a picture of the tank, and everybody got on. This is nice but this is one of those things that I put in the category of "not essential for my everyday life." I guess it was somebody's idea of a good joke, but that's not change. I think change is something like *Java* where there are things going on, as long as, once again, it helps you achieve your goal.

A lot of people are screaming. I kind of get a kick out of this right now because I actually come from the networking side. We have something that was probably the hype to end all hypes, called ATM; it's amazing that it's still on the hype wagon. A couple of years ago people stopped screaming about it because they realized that it fundamentally wasn't ready; it didn't work yet in large networks. But there's a huge amount; it's almost as bad as Windows 95. It won't cure cancer, it's a nice little technology, and if it helps you achieve your goal, you should look at it. Some of the things are very... Geez, give it a rest, folks.

The goal here is to try to offer things that move, that shake and shimmy and give people a rich experience. And we're doing it; Sun's doing it; everybody's doing it. That's great. Ultimately, once again, the user is going to make their choices, and as a designer you need to decide which technology does the job for you. That's all that matters. What the name is or anything else around it, just make sure that it in fact does the job. There's some cool things going on in a lot of different areas right now.

The whole VR thing... Jim and I actually had an interesting session at another conference where we really went to see the VRML demo that SGI was putting on. And I think two or three times prior to that we wanted to get it to work and they just couldn't get it working. There's a signal right there — when you're at a show and somebody's doing a keynote and they can't get their technology to work...

But once we finally did get it to work it was actually pretty cool. Jim was very good at navigating through the little thing there and it worked out very well. If this helps you get your message around, something like this, that's great. You can actually create at some point — it's really not to the point yet where it's as easy as it needs to be — but if it helps you to get your message across to create a virtual world for the user, that's customized to them, this is neat stuff. This is one component of doing that.

Obviously, the approach of [Worlds] and other groups is to try to give you the tools to allow you to do that. That's great, because you don't want to have to go out and try and create all the stuff from scratch every time.

Once again, one of the aspects — if this is interesting to you, you should dig into VRML and understand what all the issues are and if your message will be conveyed. For example, one

of the companies I did previous work for had a lot of different business [on] UNIX, and one of them made brake assemblies. They had a real problem trying to send out the instructions for changing the brakes.

A lot of us are visual. I'm a visual person. I need to see it and draw it on the board. I can hear it and read about it all day, but until I see the pieces fit together I just don't get it. And I'm not alone; I believe there are a lot of people like that. So technology like this is very cool to try and convey a message to me and to other people on something that may be fairly complex, so I can actually offer perspective that the user can control. And they can do different things, so it's not just for creating nice little game worlds and playing the next version of *Doom*. It will do a lot more than that if your application or your goal requires that you use something like this.

Macromedia, with *Director*, they're doing some very nice stuff, too. It seems like what we're getting is a lot of different — I won't say "niche," because some people take offense — but different category technologies. And you need to select which ones work for you. I think, in general, the tool sets are something where you can bolt on a lot of these different things. As the tool sets mature more I think you're going to see more and more of an approach where the major tool vendors jump in and do a deal with Macromedia or do a deal with [Worlds] or whoever, but you don't have to go out and do the integration. Now it's still relatively difficult; it's not all incorporated into the packages for creating this stuff. It should be point and click.

Anybody designing sites with real audio today? Neat stuff, neat stuff. [NetSurf] hates this stuff, by the way — hates it. MCI's backbone just becomes completely congested; it's not a well-behaved application. But it's really neat when the user is sitting there and some sound just gets piped to them. Very cool stuff; no separate viewer. Although the viewer is still separate today, three or four months from now this stuff's all going to be integrated in. Whatever viewer you're using — browser, whatever — "integration" is the watchword here. As things mature, it all gets integrated in and away you go. So it all becomes part of whatever GUI you've selected.

But real audio is very interesting if you want to give people audio information while they're potentially reading a page, or information that changes. I know ABC News does this; the radio organizations tend to really flock to this stuff. I've got to believe that there's some other cool uses of this, potentially for things like canned presentations where you could actually click through slides and have the little description come over. There are a lot of uses for that if that meets your needs.

It would be a nice training technology, because a lot of people are using this stuff for internal use. I think I actually read where about 40% of the Web sites are for internal use only. That's a huge number, because a lot of people are still concerned with opening the door and all that fun stuff. Great technology, works like a champ; we've licensed it, everybody in the world has licensed it. So you can have them bring up and play sound and do all those fun things. Once again, if it's interesting, you should go over and take a look at it. Everybody's integrating it in their tool sets.

The biggest thing, though, is talking about this "unicast" view. Since it's really hard to do it, I won't spend a lot of time, but it's something that I believe is going to be more and more important — letting the user select what the experience is and also let you, as a content provider, learn more about the user so that you can offer them relevant content and stuff based on their interests so that they can do it safely.

The technology... As I said, a year ago everybody was worried about security. The nice thing now about security standards is there are so many to choose from. So you make your selection; they're all coming together in the tool sets, and by and large they all do slightly different things. I guess the marketers require that. Once again, I view this as kind of like HTML — I don't want to know about it, just make sure that it works, make sure that nobody grabs my

credit card and nobody understands things that they shouldn't understand from my transaction. That's all I ask.

It seems like right now — assuming that the security question is solved, and I believe there are good solid standards and draft standards and approaches and different things out there to solve it — now there seems to be this fundamental question, with me, of the user saying, “Here are my interests,” and you, the content provider, saying, “Okay, here's what I've got.” How do we bring those two things together? I can hope to get lucky and you'll find me on a “What's New” list or find me surfing — but the chances of that are becoming slimmer and slimmer as we see more content. I can hope that you'll be able to drill down with the right search tool; maybe some of them are better than others. So we're seeing a lot of work in that area because it's a fundamental problem.

Ideally, I'd like to be able to have an “intelligent agent” technology, where I can say, “Look, go find out about basketball championships from 1945 through 1950 and show them to me.” I don't want to have to go look at all these places. The user can customize and say exactly what they want and, from the content provider perspective, the tools automatically need to be able to say, “Okay, we've indexed this automatically.” You won't have to do anything. It's kind of like Web server file management; you don't have to trek their links when the system works right. When the system works right for this it automatically indexes information and it folds into an information retrieval system.

You also need to try to gather user information, and that's a real sticky situation right now. It's nice to be able to create the experience on the fly more and more, but some people take offense when you say, “Gee, we'd like to learn something about you.” Some people are more suspicious than others; they go to all the Oliver Stone movies, and they're very sure that there really is a conspiracy under every rock. That's okay, that's their right to have that view of things. As a content provider you need to make sure you offer them the choice: Do you want this service? Here's the perceived value, here's what I'm going to do. The question is whether you trust that I'm going to live up to my word or not. All content providers have to build that trust — that's another big challenge on the Web today.

You want to make sure that you provide a compelling experience first off because that also builds trust — “Gee, these people know what they're doing, there's something here of value and I may want to take a chance and actually tell them something about me so that they can customize it even more, so it will meet my needs better.” But if it doesn't meet my needs at the start, I'm probably not going to tell you anything to help you make it better because you didn't put the work in up-front. So that's pretty important, as well as remembering who I am.

Obviously, offering a compelling experience [is also important]. There are a lot of different things right now that are doing this. We can show the user things that are integrated and make the tools very “point and click” and “drag and drop,” but then the key is, okay, how do we find out profiles?

And there really is a pattern here. You search for things. You decide you like bicycles, so you enter bicycles into *Yahoo*. The only way for groups to understand what you like is by looking at those same searches; other than that you'd have to fill out a form and say, “Here's what I like.” Both approaches are valid, and probably a combination of both is the best way to get the most complete information.

And that's the problem — obviously, people are very concerned that there are profiles of them; “Big Brother is watching me,” and all that. So you clearly have to give people the option as a content provider. I know there are a lot of tracking tools for Web Servers today; make sure if you track somebody, you tell them you're tracking them because I promise you they will be very sad. Actually, very angry is a more appropriate term.

Now, I think a lot of people just don't know they're being tracked. I read about the group that tracks UseNet lists, and actually determines from people that respond to particular lists what their potential proclivities and interests might be without them knowing it. Now the company says, "Hey, you've known UseNet was public for years." Maybe, maybe.

That's a sticky issue, and I'm doing my best to just straddle that fence right down the middle. I can see both sides of it. Where the group says, "Here's a public-information asset and we've just catalogued it and applied our own intelligence to it, and our own value-added things," one could say. But did we do it with the expressed permission of all those users? Nope. Nope. So you decide where the lines sits. It is one way, though, of trying to collect this information to give the user the potential for having an experience that highlights their interests. It's a personal experience; it's this whole "market-of-one" thing.

So you, as a content provider, want to design this cool experience, and you say, "This is really neat, I know what's best for the user, I know how it should look." And the user says, "Hold it. I don't like the way you designed it — I want it to look like this." Who's right? I don't know. Clearly, there's that balance coming up and I think this is — in the industry in general — something that over the next year or so we're all going to be struggling with, because we want to design an experience that meets the corporate logo standards and all those things; but the user can throw those right out the window. So what are we going to say? There's nothing we can say. Clearly, the traditional rules where the mass market is going to take the default experience — some people will want to change it.

Think back to the way the X-Windows system worked. You could customize everything in X-Windows, every single thing. The problem is that it was so complicated only programmers did it. The majority of people who were not very technical took it at face value and said, "Okay, fine I'll use it this way, even if it's not really what I like." And the user clearly will decide; if they don't like the way that you're making them do it they'll click to something else. So you need to be aware of that.

Wrapping up, today the user really selects an access provider. They choose an interface, or maybe it came on their machine or whatever; they choose content, and they decide where they're going to spend their time, because that's the one thing everybody really values here, I believe. When they're doing this after they get over the initial hype and euphoria, they say, "Okay, I've got a limited amount of time, I am at work here, I'm supposed to put in at least a couple of good hours of work to justify my paycheck, what do I need to do the job and how much time can I afford to spend?"

You've got to capture them in that instant. That's a really big challenge, especially if you are precluded from trying to find out as much information as you can about them while you've got them. So it's trying to balance those two things. But they make that choice, so I choose a browser that was rated five cows, which is maybe my criteria, that's the most important thing I choose.

Then I go forward and tomorrow I decide I want to have this video conference. I'm not willing to pay \$200 a month to have the line installed and up all the time — I only need it for two minutes this morning. I'll pay to have the line — \$5 or whatever it costs, and there's plenty of profit in that, by the way — but I only want to pay for it while I'm using it, and you can prioritize my session based on what I'm willing to pay. You can offer a service that can rely on more infrastructure being available, not today — notice I say tomorrow — and the user selects. Please don't try this in your own home.

The user will also select the interface intelligence, how much they want the machine to try to help them or manage or control them. It all depends on your perspective. In this case, the user will decide what their perspective is. I think the industry in general will give them choices; they will offer value, and if they successfully position that value some number of people

will say, "Okay, that's helpful." Some number of people will never use this; they'll be too concerned about the privacy issue being the overriding factor.

The user is also going to select, I believe, much more of the content layout. They're going to decide if they want to see the sports section first. They're going to decide if they only want to read about hockey articles — they don't care about those damn football things. The user's going to make the choice; it's not going to be the publisher saying, "Here's what we know is important to you." It's going to be the user saying, "Just give me the whole thing — my front end is smart enough to decide what I like to see. I've told it that. I've given it permission to make the choice, and I'm going to ultimately have it my way and have a personalized experience here."

As the tools get better and you as content providers can do ever cooler things without having to work five times as hard, I think that we're going to see more of the ability to really create worlds where people decide what's appropriate to them. Personalized worlds, really, I think is where this technology is going; where, based on the interests of the user and the needs, you can create an environment that completely satisfies those needs. The way things change this may take, instead of two years, it may take three. But things are changing very quickly so I don't see it taking too long with the progress that we've made in two years.

Don't forget this, please: I've seen a bunch of sites that kind of don't know... Interestingly enough — no one was actually referring to the movie industry, I believe, though that it applies very aptly to the Web today — you can have a really cool site that's got some great stuff on it, but that's not what it is because the words are, "See Jack run." There's content there and there's an integrated message. So technology for technology's sake never works — I don't care what you're talking about. It can help if used in the right way. So I guess that's my message. With that I will turn it over to Mike.

[Tape change]

Michael Bauer: So it's tig.com, www.tig.com.

M: [inaudible]

Michael Bauer: It's T-I-G — the Internet Group — .com. All of these will be up there for you. I want to focus on the latest and greatest — and it's funny, Chris and Jim and I don't actually closely coordinate when we get together for these presentations, but it always seems that we say something that's complementary to one another when we get into this.

The one thing that I did want to follow up on — this is our site, and it's been downloaded onto this laptop here and I'm going to be using it to go through the presentation. That way you'll be able to go through the presentation when you go back on-line and see new and additional information.

The comments that Chris was making about developing this personalized one-to-one type of environment is kind of what we've been developing for a little while here. Just to illustrate this before we get into the seminar — it says, "Hello, visitor from the Internet Group. I see you're using Netscape. Since you've been here last we don't have that kind of tracking of things in place." That's kind of where we're going. What's new is our commercial Web development presentation, which will be up on the Net. Check it out and we'll take a look at it later on.

This can be a really useful type of thing. Let me illustrate what a site can do and hopefully what you'll see when you come in. For example, if you came in from another site like IBM, and were using Mosaic or something like that, when you come into our site it will try to

customize itself to your browser and to the particular company. Here it says, "Hello, visitor from International Business Machines," and if you're using *Mosaic* it pre-formats the site for you depending upon your particular browser.

That's the kind of direction, as Chris pointed out, that a lot of sites are going to, and there's a lot of value that you can get out of that — you, as in the marketing capacity. [Inaudible] the number of domains that are coming in. By looking at things from a more dynamically-created site, you start to access some more interesting things — for example, where people are coming from, what URLs are referencing them.

I apologize; this site is a little hard to see because it's a dynamically-generated graphic, but it's something that you can start to capture. I remember when I was a little kid just starting to watch *Star Trek*, I never believed that one day I'd have a laptop and a portable laser.

When you start generating things dynamically and detecting where people are coming from and what kinds of things they're doing, you can start to get a lot of interesting insights. We had just gotten a mention in Stuart Brand's article on *Hot Wired*, and in that top line you can see our hits went up with Stuart Brand's article. This is where we get hits from *Yahoo* on Microsoft Network's Home Page. A lot more hits are coming in and you can start to see those kinds of things when you're starting to get this generation on a dynamic basis. You can also start to see certain things like what kind of browsers people are using, and can configure your site appropriately.

This is actually kind of news to me; this top line here is *Netscape* and *Mosaic*, and here are a lot of the other browsers that have come into this site. We can track those. But I get flabbergasted at just the number of browsers, the different kinds of browsers that come into your site. It's just pretty amazing. That kind of information is valuable to you and you can start to capture that to create these sort of dynamic sites on the Internet, which sort of customize themselves to the particular people that are coming in and the particular places they're coming in from. So it's definitely a trend we think is going to continue.

What I'm specifically interested in is commercial Web development and going into a presentation on that. This whole site is up on the Web and you're going to be able to go to it. I'm just going to bop down through here and get these slides up on the Net.

I think one of the main things to keep in mind is this overall perspective of the Internet and how it is really valuable across the entire enterprise. This is a real serious place, and you have to try and sell things because where you're going to be successful is when you get all groups within your organization starting to use the Internet in some kind of capacity. They all are going to start to have maybe different types of benefits that are going to accrue, but they're all going to share a lot of the basic costs in terms of the connection and so on.

So when you're starting to look at a site for marketing or sales purposes and also for internal purposes, you really need to have someone at the very highest levels taking a high-level perspective on how everything is going to fit together, because that's the way you're going to get the most benefit out of it and the way you're going to be able to justify the costs for the site.

Commercial domain in general is going up. As of January, 1995 there were some 30,000 commercial domains; now there are about 115,000 commercial domains in the last count. So growth is pretty much incredible. Of course, you've got to keep in mind that a number of those commercial domains are things like *diapers.com* and *toothpaste.com*, and people that are actually registering to the marquee domain; so you have to keep that in some perspective as you're developing a business plan or business case for getting on to the Net.

But you can see the domains growing pretty rapidly up in through the 100,000 range. If we track this, giving those specific commercial number of domains and a number of Web sites that are going up — and these are the number of commercial Web sites that we think are

individually identified commercial Web sites that are essentially associated with a commercial domain — that number, this last number is a little bit too high; but that's tracking and thinking, and as more and more companies get on the Internet just about every one of them is going to start to have a commercial Web site associated with them. By this time next year [there might be] upwards of around perhaps 200,000 or more domains — commercial domains — registered and being used. And I really mean being used as commercial Web sites that are functional somewhere in that area.

But as the number of commercial Web sites grows, you have to continue to remember that a lot of people use the Internet in a lot of different ways and that, right now, there may be five million or so people — I wouldn't say 25 or 30 million people — on the Net. Those are the ones that can really just use electronic mail.

A smaller percentage of those can use actually graphic-oriented access to the Net, and those are the people that are using the Web sites. Those numbers are going to continue to grow. The graphics-oriented access is going to be the one to grow the most. But whenever you're putting up a site, you don't think just of a Web site; you've really got to think of an Internet application that's using all Internet mechanisms of communications for all these different segments.

I think a lot of people fail by really not getting their e-mail facilities down to begin with, before you put up a Web site. I don't know how many times we've gone through and put up a site and people start sending electronic mail and you have no idea how to get them to the people that actually can answer the questions in customer support. Or, God forbid, if you're trying to order products across the Internet you absolutely need to have that electronic mail connection down; you should really start there first, then build out your Web site.

It's sort of doing everything backwards. I also recommend building a Home Page as the very last thing that you ever do, as opposed to everyone working on it as the first thing. You need to do a lot of work in understanding who your markets are and what kind of information you're trying to provide, etc.

Again, another perspective on the Internet — and it's not been around very long, as everybody tends to know. Ethernet was out in 1973 and the first node was on in the late sixties; the true, modern Internet really never came on until, like, 1982; the Web not until '90; and *Mosaic* not until '92. You've got to keep that whole thing in perspective of what's happened really in just the last three or four years — from some of the very first Web sites and first commercial internet.coms coming out.

The first *Internet World Conference* was only December of '92. It's not even been two years that this conference has been going on; and we could have fit all the booths right out here at the beginning. Now you have this many people and this much activity.

The first transactions really only occurred about a year or so ago. Virtual reality just came out, the real search services have really just started to come out, digital cash is out there, *Java* and CNN on the Net... People think about concerns about security and concerns about the kinds of functionality that's out there; if you put this whole time scale up against something like the adoption of the telephone or television it's happening much, much faster and it's much more pervasive than any technology that has ever come before.

I don't know very many people who really have some kind of a handle on how much this is changing everything. We were doing this just two-and-a-half years ago and it's just hard to imagine what is happening in that short of a time frame. We call it "surfing the tsunami;" once on, you've got to really stay up on your board.

When you're going to start putting up something on the Net, you've got to think of developing a pre-publishing system. You're not really just putting up a Home Page, you're not putting up a brochure; you're adopting a complete model for publishing, as if you were going to

develop a newsletter or something like that. You really need to create this entire publishing system. We say we don't do Home Page, we install printing presses — that's the kind of difference and that's the kind of thing that you're looking at potentially taking on to really try and achieve the kind of goals that everybody keeps talking about.

It can get very expensive if you're trying to do this at a high level across the entire enterprise. You've got to go from the very beginning of creating sort of original content and graphic design to developing a set of publications. In those publications you have to reach all your different users, ideally not just the people that can use the Web and not necessarily the people that can just use *Netscape*, but everybody. [People] have all kinds of different ways and usage scenarios for the Internet, all across the different types of browsers and the graphics users and up into people that are just being able to use electronic mail.

Again, from the very beginning, setting up a mechanism to take that feedback and testing that piece out first is pretty clearly very important to at least be able to take feedback from customers, requests for information, and, of course, orders as well. It's the idea of trying to capture customer usage through customer surveys and just through monitoring your Internet, so you can develop timely content, timely updates and get them out to your users.

Overall, you're going to look at a development process that has this sort of profile associated with it. Basically, this [is the] main line you're going to go through — from design to development, then to production, maintenance, and redesign at the very end here. Each time through you're going to need a different set of inputs from a number of different key people in creating a different set of outputs.

I think the most important thing that doesn't really happen in the beginning is a very clear set of requirements for developing a site so that you have a specification of what your site is going to be really like when you go forward.

That's really the basis for developing most of your site — taking the original content, developing it and creating a prototype, doing a review, getting it out in production, getting your first version out; then having a maintenance system in place that's going to take new content and get a number of different versions that are going to be developed through rapid maintenance cycle until you're going to go through again this redesign process. And the redesign process is going to be very expensive if you don't really work at developing a very clean specification of how you're going to go about doing that at the very beginning.

If you're going to go through this process — it depends on the kind of site that you're going to be developing — but the kind of time-line that you're looking at can go anywhere from a month or so up to two or three months, depending on what kind of site you're going to go for.

So from the very beginning you're looking and planning design costs, prototyping, coordinating, and assembling content, developing some translators to get that content out of its original form and getting it up onto the Net, then generating a publication and having some evaluation period. It's going to take you a good bit of time to actually get an Internet connection, if you're going to get a substantial Internet connection — especially a high-speed connection for your corporation. Once that's in process then you've got to modify the current prototype, prepare and train people to be able to utilize it, and then roll it out and start to actually go through the maintenance and support process.

Now, what's your cost to get connected if you do decide to do that? Well, we have what we call the "six Cs" of getting connected, and those go from everywhere from the communication lines, which are the phone lines you're going to install to actually give you a connection, to the connection to the Internet, which may or not be the same thing. Sometimes you can buy Internet connection from a line from the Bell regional operating company, and buy

the connection service from another kind of company — like MCI — and role those two things together. But that's just for the start-up costs; that's barely minor just as an initial outlet.

You're going to need communications equipment to get connected to the Net; and it all just depends on how fast of a connection you're going to go with and what kind of application you're going to try to do for it. This chart shows you a lower-speed marketing channel, which maybe is a 56-kilobit-per-second marketing channel, or even maybe, internally, a human resources type of communication system that is really sort of the lowest-cost type of connection. You don't need a lot of communications equipment to get started up, not much computing equipment etc. But as you go up from T-1 to a high-speed connection where you're going to do some sales your investment conceivably goes up much more substantially.

For the communications equipment, the numbers for that can go up fairly substantially because you need to actually have something like high-speed routers and modems that are going to connect into the Net. Then the computing equipment, the PCs that you're going to use to get connected to the Internet — there's going to be three or four of those that might be involved in a high-speed connection to the Net.

[You also have to take into account the cost of] software that you might want to acquire in terms of databases if you're going to do a sales system, or the commercial Web servers associated with them. And [there may be] some consulting fees to get totally connected to the Internet. To get your initial system established you're going to find some value in having some help getting started up.

Now, those are just sort of the start-up costs. Once you get fully connected to the Internet you're going to have on-line costs and ongoing annual costs. Those are going to differ depending, again, upon your speed of connection, and your costs of getting a connection are going to continue to go up. You're not going to have to buy as much communications or computing equipment, but you may need to allocate some more for connection software upgrades; you may need to allocate more for developing and maintaining the site, especially if you're going to do external redesign on a regular basis. So you're going to see potentially that kind of a profile for getting fully connected to the Internet on an annual basis.

Finally, if you're looking at overall, what your total first-year costs are going to be, you can see they're going to lay out sort of like this. Your annual costs — depending upon your speed of connection versus your start-up costs — you're going to be seeing potentially a pretty significant investment for a very high-speed sales system. Now, getting that kind of investment in there with really all those numbers in place can become a very hard sell to your corporation to develop a full sales channel that is basically utilizing the Internet.

So it's not a Holy Grail; it's not the ultimate answer. It's a significant investment. Again, going back to your business case, if you have a connection one of the nice things is that you get economies that scale well. Everybody can start using the connection; not just sales but marketing, customer support, and internal operations — they can all start to utilize that connection. So your costs can be spread out pretty substantially. Having that kind of business case can make more sense rather than something that's just specifically dedicated to one particular organization.

If you've gotten a connection, once you've gotten it, what's it going to look like? What's going to be involved in developing and maintaining that site? This is a diagram that's set up to sort of illustrate the overall configuration of what you've got to deal with within the development — all the way from design through the development, through the maintenance to the production and redesign cycle.

Typically, there's someone who's always been identified as a "Webmaster" in your organization. Now, that can work for a small organization or an upstart, but you cannot have one single person who's going to be in charge of providing all the content onto a site. You're

going to have a number of different people that are going to be contributors, and they're going to be providing that kind of content to the site — some people that are going to be just textual content [and some just] graphic content.

They're all going to need different tools to be able to pass through a Webmaster — someone who's going to coordinate and make sure the policies are followed, make sure that someone is reviewing the content before it's going up so that it's appropriate.

Then you're going to have a site that you've got to be able to establish for development purposes, some place that you're going to be able to provide the content stage to test it out before you actually role it out to production. Your various users start to use it; maybe from different kind of companies that may be out in the field and maybe in different countries.

Underlying all that, there's going to be some [a group of people who act as the] developer — if you're going to be developing a larger system — who's going to be in charge of sort of just creating a set of tools or strips that you may need, or being able to utilize the new tools that are coming out to help you create more dynamic interactive type of services on the Net. Those people all need to be coordinated in some fashion with one another, but they're going to be instrumental in providing support on the development side and on the production side.

If you're looking at a large-scale system, you're going to have some kind of a database system that's going to be in there. Then someone's going to have to administer that database, and also the production server as well, to make sure that the database and the servers are actually up and running and functioning very well.

So these costs — again, these are more of the soft costs that weren't in the specific hard costs that we talked about earlier. You've got to have this whole environment in place to really be able to provide content and get it up onto the Internet, and do so in a fairly reasonable fashion.

Now, there's this architecture that we use to manage an environment, and it's helpful for us and may be helpful for some of you as well. As you're starting to create these kinds of sites you need to... Looking at the entire site, you have your production servers and your development servers, where you're going to have at the baseline — these are the servers down here, these are the authoring tools, the contributors are on this side, and these are the users on this side, what you're going to be layering on top of the computer and layering on top of your different Web servers, which are going to be used in both production mode and potentially on a development mode.

For the contributors, laying on top of them is going to be a set of authoring tools, which could be any mix of a different kind graphic-authoring tools. The browser is going to sit on top of the user's computer. Over on the different servers, you're going to have potentially a number of applications, scripts that are going to be established and that work on top with the Web server to provide the kind of functionality and value that you want to be able to provide to the user.

So from the production side you may have feedback forms or customized scripts to access databases. They're using different kinds of database interfaces that may come with the Web server or that you may write yourself to access information that's from your legacy databases.

At this front end out here, you may need to put a layer on top of your Web servers or take advantage of some of the new Web servers that are coming out that have the ability to dynamically generate information — like I shared at the beginning [in terms of] what we've done — but also have this ability to start to manage different sessions for a user, so that you can identify a single user that comes into your site, identify them on a short-term basis or on a long-term basis. If you're identifying them on a short-term basis, there's a lot of value in being

able to manage that particular session. You can trap them as they go through it, you can see where they're going and what they're doing and you can utilize that technology to provide additional value.

For example, on a sales application it's necessary to provide a shopping cart for them to go through a site, to grab a number of different products from your site and add them to [their] own personal list.

If you want to start to create what I think are going to be the up-and-coming types of customized Home Pages that are actually created for a user for a particular site... When someone comes in, they log back in and connect to their site again and they want to be able to know where they've been, seen what they've done, and have their own — as Chris pointed out earlier — menu items that are from that particular site. That's another value of having some kind of a capability that manages a session for a user, and actually starts to remember a user on a regular basis.

M: [inaudible]

Michael Bauer: Yes, most of this is stored on the server side, although there are lots of different technologies that are starting to work together between the server and the browser. Some of the way this works — someone asked me a little bit earlier about this. When a browser particularly connects to a server it may connect in a couple of different ways and identify itself to the server: it can identify itself either by the specific reference or the URL that they're coming back with; or some of the browsers have what are called ["cookies"] that are established with a particular server, where the browser essentially has an identification that's been assigned to it from that server.

And I suggest you get your [cookies] fast because they're going quickly. There's only a limited amount of these [cookies] per browser and they're permanently stored in your browser. It's like the battle for domain — there's going to be a battle for [cookies] within browsers, and that means that there are only so many different unique identifiers that browsers can have. So if you, as a company, want to start being able to create this capability to track and be able to at the very least track when someone else comes back to your site, you want to be able to assign them a [cookie]. There's only 300 slots out there and, with the domain end-growth, you might want to grab one of those [cookies] more quickly.

That's probably going to change long-term, but, again, the whole point is that there's a lot of coordination that goes on between a browser and a server to be able to go beyond just the ignorant Web servers that are just providing pages when anybody asks for them and to start to create that dialogue between a user for a lot of different purposes. So that front end has to be established.

At the back end you need to have some kind of a development environment in place that's going to be able to provide a lot of staging and lot of content and a lot of control. This is a great place where you can start to use the Web both for internal applications — the development server may be a good place to actually have your human resource services established — and you can start to take advantage of what you might be doing out here in production servers.

There are tools and technology that you're utilizing there to actually use them back on the development server, and really start to use this tool as a project management system so that you can coordinate between a number of different people that are maybe all starting to contribute content to the environment. It's a great tool to start to use that.

These two servers are really what you should focus on developing, as both the outside production server for the inside development server and the development server used for both

external purposes — for staging your content for publishing — and your internal server for use in developing human resources. And some mechanisms to be able to start to manage how a number of different contributors are all starting to provide content in a coordinated fashion.

I think that's a fairly reasonable architecture on what you've got to prepare yourself for as you're developing these large-scale systems; we will enlarge number of groups within a company that are trying to be able to use the Internet for external purposes, and the Internet technology for internal purposes as well.

Any questions about that kind of architecture — what kinds of things are involved with the cost associated with that?

M: [inaudible]

Michael Bauer: It depends on your security concerns, for the most part. Now, this doesn't have the actual network layer, but there may be — in between this production server and the development server — a firewall sitting right here. And on that firewall that's a third computer. So if you're talking about large-scale types of systems, you're really talking about at least three different computers that are going to be involved in managing the site: one for your production server; one for your development server; and one of the gateway servers that acts as sort of a gateway between people coming in and keeping people out at the firewall, and keeping them on the inside going out and using the Internet for internal purposes.

M: [inaudible]

Michael Bauer: It can be one if you just don't want — typically, the security consultants, say, get your production stuff off of your firewall. You don't want anything on that. If you're going to use a firewall, if you believe that firewall technologies are appropriate to your risk profile, then firewalls are usually set up as scheming down. No one else has log-in accounts or those types of things; no other applications are really running that are absolutely necessary. Your development server sits inside the firewall and the production server is on the outside.

You can do this with one box — *Apache* is a great server — so that you can have a lot of different Web servers running off of one box. It's a pretty fast machine.

Any other questions about the business case or the cost in values, or overall development environment of your process that you're going to go through — timelines to be able to create a site, issues associated with it?

I'm going to go into a few things about design, just to give you some philosophy about what we think the overall design process is all about. We think you've got to look at these things — sort of a “force field” processes. When you design a site everybody focuses on Home Page design, and that's like focusing on the executive report or the cover of a page. You really should do that last. The graphic designs should follow really solid information, and that means how do you actually organize the site to determine who your market happens to be.

There's this great book called *Information and Guide*. Anybody heard of this one? It's a book by a gentleman who did San Francisco's *Yellow Pages*. He says there's an infinity of infinities of information that's out there of knowledge or data, but basically there's only five ways of organizing that information: by subject, by chronological order, by alphabetical order, by subject, or by statistical [means] comparing data to one another. And there are five different ways of organizing information such that if you utilize those principles you can start organizing your information more clearly.

Once you've organized your information more clearly, that starts to speak to what kind of graphic design you want. Principles of not going too deep into a site, being able to get to the

things you need quickly — those are the things that we're going to go into that impact your graphic designing. You really should start there because going through too many graphic design cycles is extremely expensive. You bring in a graphic design artist and you want to try something and see what it looks like; you don't like it and you can do it again. If you don't really have a clear understanding of the information design first, you're going to waste a lot of money doing your graphic design.

Graphic design is not just a Home Page — it's the Home Page and all the subject headers that you go all the way around through a site and all the navigation icons that you're going to use. All that needs to hang together and it all needs to go along with your corporate identity, so that whole bulk of work that you need to do you should really do last, after you figure out what information you want and how you want to organize it.

This interaction design is really the heart and soul of a site. You're trying to develop this publishing system — how do you interact with your users? I really think that this is the most difficult part of the design — how do you structure a dialogue with someone? You're basically almost, in some ways, writing a play or something. You need to be able to structure to actually run several plays where the players can go unlock the different directions.

Your [idea of] what different kinds of interactions are going to go on in your site will enable you to establish the different kind of dialogue that you're going to need. Again, that's going to impact the information of the design and then the graphic design, so you really need to think this through, on a higher level, of who you're trying to get to and what kind of a relationship you're trying to establish with them before you get to actually developing the graphic design.

This lower, sort of “censorial” design is what you're looking to do. How do you want this thing to be perceived? What kind of sense do you want to give to people when they come into this site? That's where the last kind of thing impacts back on what the graphic designer's doing. What kind of corporate design — do you want a staid corporate site? What are you trying to look for? And that has impact on the kind of color designs — colors that you pick and graphics that you use — and even the graphic designer that you pick.

Get a good design, then you can go through the development process and then you can look at actually creating the kinds of things that you need to create. But the focus should be entirely on adding value. Again, this is probably... Has everybody been to the FedEx site here so far? This is an example of what probably is one of the best designs up on the Internet. The FedEx manager says they constantly laugh at how many people really like their site. They did it kind of quickly and it doesn't have really wild “WYSIWYG” kind of graphics associated with it, but the difference is that it actually adds specific value. You can specify a packaging tracking number and you'll actually find specifically where your package went.

That's this theme of Chris's — I'm trying to get to that, actually — the one-to-one interaction that you need to be able to establish a relationship with a specific person. That's when the value of the Internet starts to come out, and the value of the Internet comes out in relationship to other channels.

I can do this kind of thing, get more information directly off the Net, not wait for 1-800 service or anything along those lines. That's where this service starts to add in unique value that you can't get through any other communications channel with your customers.

That's the ultimate thing that you need to really understand — how this introduction of this new channel differs, compares, and contrasts with the other channels and whether or not it complements them. In FedEx's case it complemented, so it makes good sense. They're going to continue to extend it. Now, once you've defined the value of your site and really understood the design of it then you may look at some of the graphic design capability, the graphic look and feel of your site.

This is a great site that has captured some of that kind of thing. Who's been to the Southwest Airlines site and seen it? It's good. It's potentially becoming a dated type of design — the designs probably become dated every three months on the Net. This design uses a metaphorical navigation device where there's about 14 different things it can connect to. It's kind of for people that are visually oriented, and if they are they'll be able to kind of get it right away — “Oh, I'm at a ticket counter, I can do lots of things. Maybe if I click on this guy I'll get a message, and if I click on this mail thing I can send an electronic mail message. If I click on the cash register I can find out prices. I can click here and find out service areas, news, fun vacations, information about reservations, not exactly making reservations quite yet, but I can do that kind of thing and then also getting at the picture gallery of the planes that the site provides.”

So they thought through, I think, pretty clearly what kinds of things they wanted to be able to do. Maybe they got lucky because they only have one sort of point of experience with their customers, so they could utilize this graphic to provide a navigation for their site; but this type of approach is pretty helpful. A lot of designs are going with smaller graphics. If you look at *Java*, they use small icons that are very specifically focused. We think that lighter type of design is helping people understand what kind of information they can get to and what kinds of interaction they can support, or where the designs are going to go, but this is a useful metaphor to keep in mind.

Again, this sort of gets back to this whole interaction. I talked about developing a publishing application, and a lot of people are starting to come up with a different type of metaphor — a programming metaphor, actually programming a small [application that's] something like a television station.

Something like “The Spot,” which is a daily sort of Internet sitcom where you can go to every day. These are all struggling actors — they're not struggling right now, I'm sure Fox has picked them up and they're going to do some kind of a television series — but each of these actors has a house in Manhattan Beach, California, and every day they were just basically jabbering on the Net. People kind of tuned in to them and kept coming back to them on a regular basis. It got so it was a “Cool Site of the Year” by whatever self-appointed Internet God that decides what goes on and the different types of capabilities that are associated with it.

Chris talked about how almost every site now is updated at least monthly. That's why I say I want to write a book like *How I Hate the Internet*, because you're obligated potentially to do this kind of thing. It doesn't make any sense to do this if you're not going to do this; so if you're going to make the investment you've got to make the investment both in all the equipment and capital costs and also in internal costs, and not only for development and designing the site to begin it, which is nothing compared to what you've got to do to maintain and continue to keep it updated.

That's the real cost. You need to understand — again, going back to the first principle and looking at the entire business case — what you're going to do with the site and does it make sense for your entire organization.

Now, if it does, there are a lot of different ways to sort of get your name out there. This is actually a screen from *Submit It*, which is a site that you can use to submit a single URL to this site. It will go out to all the other search services that are out there and it really provides you with the capability of advertising your site. This is particularly useful for you guys when you want to be able to market your site quickly and make sure your sites out there have a capability to go from one spot in *Yahoo* and *WebCrawler* and all the other sort of categories. That's pretty useful.

Part of the overall process of free marketing is only going to get you so far. You really want to start on getting a site out; you're going to want to really start looking at advertising.

More and more content comes up and it's more and more difficult to find people. Advertising is going to get more and more expensive on these more popular sites. That's definitely going to be something you've got to go to.

Bottom line — always coming back to the business case. Does it make sense? Can you get enough benefits from each of these different areas while still sharing a lot of costs, which can be significant in terms of equipment and also in terms of commitment?

Lots of tools are coming out to make it easier and easier to do these kinds of things, and I think it's definitely in your interest — if you're on a surfboard and taught not to look at the board but look at the shore — where are things going? I think things are going more and more away from static white pages and static servers to dynamic servers that are providing you with access and customers with access that's dynamically presented and generated for them; but also providing the ability for you to go in and actually start to make changes yourself and manage a site more quickly.

Our whole site-wall is dynamically generated and we're able to go in and make modifications to individual page elements — or “objects,” as we call them — and groups of objects in a straightforward fashion. That lets us change and move things around and modify the design and so on. There are lots of different tools that are coming out to do those kinds of things, and as you're starting to scale up and have a large system where you have a lot of people involved with that, those are the kinds of things you kind of need to start to embrace and look forward to.

That's pretty much my piece of this. I'm the dry guy, I guess. I just try to provide the basics. Jim will be coming in and talking a lot more about marketing great sites and things to do, and contests and so on. I think later on we'll talk about where we think things are going in terms of intelligent agents and their integration with the dynamic animation capabilities from *Java* and so forth. Any questions about anything?

[Tape change]

Jim Sterne: Chris was kind enough to introduce me this morning, so I won't belabor the point. I'm an Internet marketing consultant. I've been in sales and marketing for 15 years, and I'll provide a shameless plug for my new book that's available in the John Wiley booth. I won't let you forget that one. Chris was kind enough to say that I was going to present “Sterne's Rules of Server Design,” and when he told me he was going to do that I wasn't sure if he would. These are the marketing rules here in a nutshell: Make your Web site fun, useful or interesting; make it easy, fresh, targeted; [make it] a two-way street; and make it personal.

Those of you who wanted to catch other sessions, now you know everything. If you want to know what I mean by that, there has to be a reason for somebody to come to your Web site, there has to be something to draw them there. And if making it fun or useful or interesting is going to get them to show up... If you're really good at it you'll be listed in Glen Davis' “Cool Site of the Day.” You might show up on the “What's New” pages. But the best of all is word of mouth; that would be fabulous. If you have something that's really worthy for your constituents, the people that you're targeting, then people will talk about it.

So how do you make it fun and how do you make sure that you're keeping with the culture? We hear a lot about “netiquette” and Internet culture, and I think it's important to know a little bit about the culture so you understand why the Internet rules apply. If you understand why, then you don't have to go by any hard-and-fast rules — you can just use your common sense.

The Internet is a frontier culture. That means that when it started it was a small group of people in uncharted territory. They all had the same goals, they all had the same problems,

and they were all working together remotely. So if somebody said, "This is hard to get files from this machine to this other machine, does anybody have a clue on how I can do that?" And somebody else said, "Oh, here's this file transfer protocol thing, why don't you try it?" And somebody else said, "Oh I did try it but I fixed it a little bit and now it's a little bit better."

So it was this idea of "let's work together and make this community." Sort of like if somebody's barn burned down, you'd get together over the weekend and help him raise it — again, because their livelihood supports the community. You want everybody to be able to work together, and it was very personal, there was a code of honor, and it created the gift culture. The gift culture begins with the fact that the Internet works by agreement, not by contract.

I put my computer on the Internet and suddenly I'm saying, "you can use my computer; if you want to send e-mail to him you can route your packets through my machine." I'm making a gift of my machine to the network, supplying a resource. The next step was, "Gee, I've got a database of weather statistics for the last 20 years, I'll make that available on the Internet." It's a gift.

Now, it's that frontier mentality and gift culture you've got to combine in your marketing approach — because it's expected, because it's tradition, but also because it's how you compete for people's attention. There are so many Web sites to go look at; why would they go look at yours? Because you offer something of value, something that's interesting, something that's fun. Fun is hard. Comedy is not pretty. Making something that people like to go to is real tough because the most successful ones are non-commercial.

One of the most often visited sites is the "Cool Site of the Day" site. Let's go there and see what Glen has discovered. Glen tells me he can take sometimes up to five hours of surfing to find something. He says it's kind of a combination; first of all, there's so much [of the] dregs out there; and secondly, he's seen a lot of sites so he's got to find something new. It takes him some time, which saves us time, so therefore it's a very popular site.

How does a commercial entity make it fun? Or, if you're doing an internal server, how do you get people to go read the employee manual? Why would you want to go read that? If I specifically need to know what the travel policy is, okay, I'll look it up, but I won't look it up again. It's a challenge.

Here is something that's fun. This is called "Riddler." Riddler is one of those fun things that's out there that's a game, and you can win prizes. As a commercial company, you can sign on with Riddler to become one of the sites that somebody has to go to in order to play the game. So you pay for the privilege, and a user gets to just go and play the game and have a good time and maybe learn something about your product along the way. It's an interesting idea.

But if you have a product like allergy relief medicine, how do you make that fun? In fact, as most of these slides — I didn't click these just before starting today, so they're old. This one has actually been updated. The FDA came down on them and said, "No, no, no, you have to call this the [Clairitin] Allergy Symptom Relief site." So don't forget your attorneys — you have to keep them involved in the process, too.

How do you make this fun? Clearly, if there's a coupon at the bottom that's kind of useful, that's nice. But what do you do to make it fun and get people to show up? These folks decided to provide the "Sneeze Page" — yes, you can now download disgusting sound bytes of different people sneezing.

I give straight A's to these people. [Cognos] makes database and data-analysis tools. Pretty dry, pretty boring. Well, they decided to tie in the World Series; what they're offering is their power-play piece of software and 1995 regular season statistics and 1995 postseason statistic databases which you can download with a small version of their product. You can slice and dice baseball scores and stats and batting averages as long as you want. Oh, by the way,

you're using a trial copy of their business tool — they hooked you. It's free, come and get it, right off the Home Page.

[That's a] marvelous tie-in of a cultural event, and something that's fun, something that thousands of people are downloading that has nothing to do with anything that would ever make anyone want to buy their product. But probably enough people in information systems departments are interested in the World Series who would say, "Gee, this tool is easy to use," or "Now I know enough about it, maybe I'll learn about their professional version of it and I'll go talk to their sales reps." That's a nice way to draw people in.

Then, of course, there is just good writing and good Web design. Who here hasn't been to the Ragu site? Okay, about half of you, great. For the rest of you, it's at www.eat.com. This is "Mama's Cucina." If you have a crust of good honest bread and a nice glass of wine and a little pasta, you are a rich person. But it is a warm and friendly Web site. It has a style, it is Mama talking to you. All the way down to the bottom of the page it says, "This next part was written by Mama's niece Anna the lawyer," and it's the copyright clause.

It's friendly and fun. This little welcome comment changes every time you show up. Hit reload and she says, "Please come in my kitchen, just remember to wipe your feet." You can learn to speak Italian; Professor Antonio — "When the moon hits your eye like a big pizza pie, that's amoré" — you click on that and you can hear it.

But they didn't stop with just that. You get phrases like, "Next to Ragu pizza sauce I love you best of anything else on earth." That's an important phrase to know in Italian. So this is fun and friendly. They also have Italian art lessons, and they also have goodies from Mama. So here is a coupon — not that you download it, not that you print out — but you send them e-mail saying, "Yes, I want that coupon." And they mail it to you physically, for two reasons. One is they can really track it individually now — when that thing comes back through the retail system they know where that coupon came from, and you can print up dozens and dozens of them and it doesn't confuse the retailer.

Imagine you're a checkout clerk and someone walks in with a laser printed piece of paper with a coupon on it; you're going to wonder what magazine they got that out of. So this is a nice easy solution to that, and it tracks it. But the Ragu "Internet Surfing Team T-shirt" I think is even better. Here are the steps you have to go through: send them an e-mail that says you're interested in the T-shirt; they bounce you back an e-mail that is a form for you to fill out — name, address, and a couple of questions; and you send that form back to them in an envelope with \$3 for shipping and handling and two proof-of-purchase coupons from the back of their jars.

Oh, they made you go to the store. They made you buy the product. How many people are doing that? Ragu is back-ordered, and they can't keep enough of these in stock. People like the site — it's a friendly place to hang out, they enjoy it, and they're willing to participate.

Fun is hard. Useful and interesting actually isn't as difficult because you know things about your industry that are not trade secrets, but your company is a repository of knowledge about that industry. It has to be in order to compete. So there's some information there that's worthy of publishing for people.

Well, here's some information that's worthy of publishing. Everybody's heard of the FedEx site because it's so easy to comprehend. You type in your air-bill number and it tells you where your package was, when it was delivered, and who signed for it. Marvelous. Customer service — really nice, clean and crisp, useful. And yes, I do all of my stuff FedEx now instead of UPS because I was able to do this. And yes, UPS now has come on with their competing version; in fact, they even have a time calculator where you put in the distance and it says approximately how long it will take, and you put in the weight and it will say how much it will cost. But, gee, I'm used to FedEx now. They were first, therefore I'm their customer now.

Here's Alamo Rent a Car: www.freeways.com. You can rent your car, you can check out the map, you can download a bunch of games to play with your kids who are in the back seat because we're not there yet. But you can check the reservations, look at the locations of where you can pick up cars, check out the car models and see if it's big enough to hold my golf clubs. Am I going to get all six kids in the back seat of that car? [You can] tell them when and where you're going to pick up and drop off, check for availability quick, and make your reservation.

Now, this has been up for a couple of months. The announcements we're hearing at this show are that credit card transactions have been approved, security is getting tighter, and electronic cash has started to happen. There are now banks that are on the Internet, so by this time in six months the actual money thing will be a dead issue, and we will be buying and selling with no hesitation whatsoever. But offering this kind of information to people... Is the car that I want available in the city and on the date I want? Okay, make the reservation. That's useful, that's something I'm going to go to because it will actually make my life easier.

Here's an interesting example. This is the General Ribbon Corporation, and they refill ink cartridges for ink-jet printers and toner cartridges for laser printers. There's nothing very interesting, fun or exciting about that; it's just a supply that you have to buy every now and then. They said, "We want a Web site, we want to be up on the Web, it's hip and cool, let's put up a Home Page." We went around and around about why anybody would come there. "Oh, well, our products are less expensive, they're environmentally safe, they're high quality." Yes, but why would anybody want to go there?

And we finally found out that they have a special knowledge: they created the guide to ribbons and cartridges. You pick if it's laser, ink jet, dot matrix; in my case, I have an Apple *StyleWriter* and when it runs out of ink and I go down to my local Staples and I think, "Oh, I'm about to run out of ink so I better pick up another cartridge, but I don't know what the part number is." And I look and there's these little boxes and there's hundreds of them and one of them fits my printer. So I can go to this to find the part number I need, and now I can even call Staples and order it or I can go down there.

But they add, "By the way, consider the following alternative, which is money-saving: specially formulated ink, environmentally sound, shipped to you directly." So they're giving you the benefit of their information, of their knowledge, and they're serving you something that's of value to you and then giving you the sales pitch. That's the correct order.

Well, what is interesting or useful about allergy medicine? It will make me feel better when I'm ill. And the Sneeze Page is funny — I'll show up there once and laugh at it and tell my friends that I found the Sneeze Page, but I'm never going to go back there. Why would I go back here? Because they offer gardening for allergy sufferers — when to plant certain plants, which plants are going to be nicer to your condition, low-pollen plants by zone, and all kinds of gardening tips and advice from people who can come in and give you what their experiences were. [They're] creating a little center of, "We're people who have common allergy problems."

I know a woman who recently took a six-month sabbatical because her son has really serious allergy problems. They had to redo their house when they found out what the problems were to make sure that the carpet wasn't emitting fumes, make sure that the paint was right, [check] what he eats... She says that she has met people through this gardening advice whose children have the same condition, and a support group has formed out of it. That's useful; that's something people will come back to, and, of course, they'll remember the product.

So that's fun, useful, or interesting. Now we have to make it easy. And that falls into a couple of categories: find, read, navigate. If you can't find it, what's the point? If you can't read it, what's the point? If you get lost when you get there, you've wasted your time.

You have to promote a Web site — if you have an 800 number and you don't tell anybody, nobody will call. If you have a Web site and you don't announce it, nobody will call. So the first thing we want to do is get out there on the Internet and tell people that you have this new Web site.

There's some help you can get. These guys — *The Postmaster* and *Submit It* — are two services where you type in your URL, you type in your description and you hit "go", and it goes to all of the What's New and Announcements and Web sites and posts it for you automatically. Pretty swift, pretty nifty.

But I prefer the Eric Ward method. Eric Ward is a young man who started *NetPost*. He will be a publicist for you; he will go to each individual announcement Web site and look at the normal length, will look at the style, the tenor of the posts, and create the right post for that particular site.

In a lot of these sites the stuff automatically comes in and then human beings look at it and say, okay, it belongs in this category, or that's not interesting enough. Eric Ward knows the players — the people behind all the Web sites — and walks you through the process. He is an Internet publicist, somebody who's worthwhile to work with.

Make it easy to read. It's real tempting, when you create a Web site, because it's a new medium to say, "Let's trick it up, let's make it fun, let's change our logo a little bit, change our corporate style a little bit." Well, gee, we just lost brand equity, and we've made it harder for people to read.

Everybody likes to pick on *Wired* magazine, and, yes, I admit to being over 40 years old. This is nicely designed; there's not too many choices, it's pretty crisp. I have trouble with the background color and I have no idea what those icons mean, but it's targeted to a specific audience, so if I were a generation X-er I'd look at this and I might be impressed and might be delighted and happy. And that makes sense, but there is no sense for hyper-fuzzy.

This deserved being the Netscape Hall of Shame number one pick. It's not that you can't read it, it's that you don't want to. I had no interest in going any further in this Web site to find out who they are or why they are. It just made me feel bad.

Make it easy to find, make it easy to read, and then make it easy to navigate.

If I give you my business card and it has a street address, you have innate tools that you grew up with — you know that I can find a city on a map of California, I can follow the freeway system, I can get off at an exit, I can turn right and left at a stoplight, and when I get to the building I know there's visitor parking, there's a front door and there's a receptionist who I can announce myself to.

Also on my business card is www.targeting.com, and when you go there you don't know — there's no general rules, there's not even gravity. Where do I click and why? It's your job to help your people figure out how to get into your Web site and what can be expected there.

Here's an example of someone who did a pretty good job. This is the usual suspects up front — Overview of News, Products, Contacts, Service and Support. If I click on Products, that menu jumps to the top of the screen and products is pushed in. Okay, I know where I am, and if that's not where I wanted to be, instead of going back to the Home Page I can move sideways because those other choices are still up there.

Now, if I go into Peripherals — let's say Jim is looking to buy a new printer because his *StyleWriter* keeps running out of ink. We go into peripherals — and there are a bunch of them — and sure enough, I can find printers and click on that, and here's a humongous list of the printers that HP makes. Well, I don't know from printer part numbers and names — they're not very descriptive names, they're computer part numbers.

So if I'm a technician looking for a particular part, maybe that's useful. If I'm just trying to buy a printer, it doesn't help me. There's something down here, a little index box. Let's go to

the index. The table of contents lists everything that's on their Web site — this goes on and on and down through the floor. It's a big list.

If you're looking for something in particular that you know you're after, it's a great resource. If you're just kind of shopping for a printer... Let's try Search. At the top there's always these binoculars, and you can click on that and go to the Search page. Well, there are some instructions with this search page; in fact, there are three pages of instructions for this Search page. There is Context Search, there is Boolean Search, there's Fuzzy Search, there's Text Search, there are two databases to search from and there's help with keywords. You need to be a computer scientist to figure out this search tool.

On the other hand, HP sells a lot of equipment to computer scientists who would love to come in here and learn how to powerfully find what they want. They're interested in that and they're capable, so for them it's a good thing. For me, I'm still trying to find my printer.

Well, let's go back to this Peripherals directory and discover "Helping You Choose." Okay, I definitely need help — what is that? Well, here are some questions for you. What kind of computers will you be primarily connected to? Oh, Macintosh. Black and white or color? Black and white and color as well, rather than just black and white. How many people will share the printer? Just a single user. I know the answers to these, and they bother to ask you. If I click on "Find Printer," I get a list of a handful — nothing overwhelming — the platform-supported, what style and type they are, and some pricing information. I can say, given this price range, that I'm interested in that one and, bingo, it's found the printer for me.

Now, if I'm a technician looking for a part or if I'm a purchase agent looking for a specific printer that's on the requisition, if I'm a computer scientist looking for some obscure thing somewhere in the HP database, or if I'm a guy who wants to buy a printer, I have a way of getting into the HP Web site. They've provided enough tools for me to access thousands of pages. That's good navigation.

Keeping it fresh [is important]. People expect it to be fresh. Those of you who have ever printed brochures with part numbers and prices know that within about 10 minutes somebody changes something; product management changes a price, somebody in the technical department changes a feature, and sure enough your brochure is — well, it's only a little out of date, there's only a couple of things wrong, and I'm not going to spend another umpteen thousand dollars to reprint it; we're going to have to wait until it's really wrong before we get that far, or we'll get those little stickers and hire some high school students to stick them on 10,000 times. You've done that before.

On a Web site I expect it to be current because if you change something it only takes "that long" to make it correct on the Web site, and now it's published globally. So as a customer I expect that to be the latest and greatest information. Now my catalogue can say, "For the most up-to-date information visit us at www.company.com." So make sure that it's fresh.

One of the problems that you're going to face is that a brochure is a physical entity. It sits on your desk, you look at it and you know when it's out of date. A Web site is kind of a mystery; it lives on the computer and you don't look at it all of the time. You don't see it, it's not in your face, how do you remember to update it? If you've got 10 pages on your Web site you can keep track of it; if you've got 20, now you can do it on a napkin; but if you have hundreds or thousands of pages, like most companies do, it's very difficult to keep track.

Keep a calendar. In fact, I've seen companies that put expiration dates in their Web Pages under "Comments." You don't see them in the browser. So they can run a report that says, "Show me everything that's going to expire next week, and they can call up the department manager and say, "Hey, you owe us new pages as of next week. And if you don't

give us new pages, we're pulling the old ones off." It's your responsibility to make sure it stays fresh and to set up systems to help you do that.

Finally, people expect it to be the latest news. I'm constantly surprised by going to companies and seeing that the latest press release is four months old, or the What's New button is from 1994. Chris mentioned that earlier; that's unacceptable. I've been beaned really bad for that. I came back from one seminar saying that to people, and I got an e-mail that said, "Really enjoyed the seminar. Visited your Web site — information was really old. Thanks for the lesson." So I wrote back in e-mail — no, I went and updated my Web site — and then I wrote him in e-mail, "Very sorry, thanks for the lesson." Sometime tonight I will change where I have my list of speaking engagements, and I will make this one under "Previous."

M: [inaudible]

Jim Sterne: I suggest Level One and Level One-and-a-Half to get into your Web site. Level One is the Home Page. It's the image and access front door, and it's the place where people who are just surfing can kind of get to know you and check it out a little bit. But somewhere right there on the Home Page is the Expert button, or the Search button, or the "I know where I'm going, just let me get there" button, because the second time somebody comes to your site they're not surfing, they're there to get something in particular. The first time, yeah, they want to see what's cool, what swivels and twists and what kind of music downloads they can have and all that stuff. The second time they're there to do business, so you want to make sure that there are more tools for the guy who's looking specifically for something because he's more likely a buyer than a surfer.

Don't do this in a vacuum. Make sure that your Web site is tied in with the rest of your marketing. Maintain your brand equity, make sure the logos look the same and that the company attitude and style is the same so that it's recognizable. And tie it in with all of your other events; let people know where you can be seen in public and what trade shows you're going to be at, and what specials you're offering and what discounts are available. If you're working with a dealership organization or some sort of distribution organization, direct people to whatever events they're up to that are promoting your products, etc. Keep it up to date.

Silicon Graphics — they're out there a lot on the Internet. They like to seed their logo all over: "Powered by Silicon Graphics." They're pretty good at keeping their Web page updated. You go there and, periodically — not quite every month and it's not every two months — they come up with a new Home Page. That's nice. They keep the same button, so that if you go there and it looks different you still know how to navigate if you're looking for something in particular. But there's always something new and something interesting for just the general browser to look at. So that's keeping it fresh.

Now we want to make it targeted, and for that I need to go to the next file that I've got. Another reason that you should keep your graphics small is that all over the country there are people like me who are using PowerPoint presentations to give examples of Web sites, and if your graphics are too big and it takes up too much room, PowerPoint can't show one 20-megabyte program to split it into two 10-megabyte programs, so we're going to call up the next one and talk about targeting.

The first question that I always ask people who are working on their strategy for their site is, why on earth do you want one? Well, it's hip, it's cool, it's the right thing to do. No, no, no. What are you trying to accomplish, who is it for, why are you creating it? That gives them pause.

Once we've figured out what the reason is and what the purpose is then you can start worrying about design. Are you trying to improve your corporate image? You've got another

ten minutes to do it. If you don't have a Web site yet — six months ago it was nifty and cool to have a Web site, twelve months ago it was newsworthy — Bank of America, the first bank on the Internet. Well, all it was was a two-page brochure, but they were the first one. Now it's kind of iffy. Six months from now you will be conspicuous by your absence. Even if it's a bad Web site, get it up there — it's expected.

Customer service is my favorite soapbox. If you want to use the Web for customer service, I'm delighted. Just to let people know that your product is still out there and doing well and top of the mark, for prospect qualification, to help the salespeople move through — if you've got a long sales cycle, if you've got a complicated product, your salespeople spend a lot of time giving presentations and giving seminars, trying to educate people about what your products are. This is going to let [the consumer] learn it by themselves, and they're going to come to your salespeople knowledgeable and ready to ask buying and closing questions.

So, of these, decide what's important to you; then you can brainstorm. It's really fun to sit around with people and say, "What's possible? Given all of this technology and the state of the art, what could we do on a Web site?" You get this long list of really nifty things, and then somebody says, "Yes, but we've got limited resources."

Now it's time to prioritize. Which one of these is the most important? Given that, okay, let's accomplish this one first and use those neat ideas, and then in month three we'll do this one, and then in month four we'll do this one, and then this one. We've got a whole series of new things to add to our Web site which are public events for which you can send out a new press release — company.com now announces a new feature on their Web site. You can continue to attract attention back to your Web site; that's worthwhile.

But you've got to prioritize, you've got to decide why and then that will tell you who it's for. If it's for corporate image you want to feed to the press and to the industry analysts whatever it is that they want: the press releases, the deep background, the life story of the CEO, all the stuff your customers could care less about. But if corporate image is important to you and you want to make sure your story is told, give the press everything they need. Give potential investors, the people who are in charge of investor relations — get them involved. Obviously, customers and prospects for customer service — I have prospects up there very intentionally — customer service is one of the best tools that you have on a Web site to turn people from prospects into customers.

If I want to buy a roomful of chairs, and I go to one Web site and there is a bunch of marketing material on how fabulous their chairs are, and I go to the other Web site and there's not that much product information but there's a bunch of customer support services, I realize which company will be easier doing business with. If I become their customer, I have all this service available to me.

[Then there's the] buying decision. I talked to a guy who's trying to make a decision between a Compaq and a Dell machine, and he did that, he looked at the two. He wasn't just buying one, he was buying 250. He thought about the engineers that are going to come in after-hours and install and configure these things, pull the wires through the ceiling and plug all the printers in and try to make it all work — they're there off-hours, they're not going to be able to call the 800 number; but they're going to have access to the Web site, so which Web site is going to give them the most support?

The Compaq Web site had printer drivers; it had configuration advice; it had pictures on how to plug things in; and it had comments from other customers on experiences they had. He said, "Bingo." That made his buying decision; not because they went on and on about how wonderful their machines were, but because they offered lots of customer service.

What is it and who is it for? If you know who it's for now you can try to make some assumptions. You can go out and do a little research and figure out who those people are and

how they accessed the Web site. Are they on a 14.4 modem? Do they have a 10-megabit connection so they can put up video — heck, they'll like it, they'll appreciate it. But maybe they're not... Let's say you're selling UNIX workstations. Who buys UNIX workstations? People who already have a lot of UNIX workstations, primarily. Nice big screens, fast connections, corporate LANs. Gee, go ahead and fill up your Web site with a bunch of real high-speed capable stuff — nifty.

But remember that the engineer who is on his 10-megabit line in the afternoon goes home in the evening and has just a couple more things he wants to finish up, and he's on a 14.4 modem. And he gets so annoyed that he goes out the next day and buys a 28.8 modem; he tries that and you still can't do video on that. You're still not going to do comfortable audio on that. So be real careful about that.

Are these people dialing in or are they permanently connected? Are they Super VGA, are they UNIX? If you take a screen that's just gorgeous on a Sun workstation and you put it on a laptop, you can't see much of it because they blow it up to get all the pixels in there. Are they coming through America Online or are they Netscape? If you need to have something that is formatted to look like the *Wall Street Journal* then you need to use all the Netscape enhancements. It looks gorgeous and it's easy to access — unless you're coming through America Online, and then it looks like a mistake.

You've got to make the actual decision. These people said, "We don't care about America Online — CompuServe allows their people to use Netscape. The majority of the people use Netscape. In fact, I just love statistics. You can draw any picture you want. I want to be very clear about what this picture is. Browsers used to select the random site link at Yahoo in September — that's who we're looking at. Now, these are clearly people who have more time on their hands than sense.

Well, I'm surfing the Web and I don't care where I want to go — it's random. [That person is] not likely to be our customer. But 79% of them are using Netscape; you have to decide that you don't care about the 10% who are on Mosaic, that out of every 100 people you don't care about the 10 folks who happen to come on your site in Mosaic and don't see it centered and can't use the frames and have a horrible time navigating because you're enhanced for Netscape.

Even worse, you don't care about the four people who are using text-only; when they come to your Web site, instead of your beautiful Home Page, they see the word "image" in brackets. They don't even know where they are. Is that okay? No, it's not.

The solution then is to allow people to choose for themselves what your Web site looks like. It's up to you to provide the choice. Here we have [Sylvia's Ghost], which was appropriate for yesterday. Click on the Netscape version or the other. If you're using text-based, like Lynx, we have completely text-only pages. Well, if I'm on Netscape I might pick that one as well because it's faster; in fact, I might go up to Options and hit "Images Off" because I want to get at the information.

One of the things that Silicon Graphics learned was to put up a big graphic, because that's what they do for a living, and if you click on a Web site called Silicon Graphics you kind of expect a big picture, so you deserve it. But down at the bottom they had the blue text — the choices in text. And that's great, because you can do the picture, and you know if you click somewhere in the picture you're going to get more big pictures; and if you click on the text it will go to the text areas.

If I'm in Lynx, I see "Image" and then I've still got all of my choices there. And I talked to them and said, "Guys, please do me one favor? Take that button bar of the text and put it at the top so we don't have to wait at 14.4 for your front page to load before we get the options." And they did. So it's very quick; it's easy to make the choices.

I'm a Mozilla killa... Okay, I've got Mozilla 1.1 or later — give me the full-on, full-tilt, “enhanced for Mozilla” experience. Or Net Monster Free — no funny look — Net Monster. Here pal, no sirree, I'm doing just fine with my browser. Give me that, don't give me that chaotic stuff. I want the look and feel of standard HTML.

Give your people the option, let them tell you, and then keep track of your stats and how many people went to the text pages and how many to the Netscape pages. Then you can decide if you need to continue doing the dual development. Question?

W: [inaudible]

Jim Sterne: In this case, entirely. I have no idea what this Web site is about. But that's their Home Page.

W: I'm worried about the information I want to put on. The first thing they see is that they need to make all these selections — you can select the browser or if you want just text or not — and I'm worried about that getting in the way.

Jim Sterne: There are two approaches. One is to make it subtle, like in the lower corner so that the person who really needs it can find it and it's available. The other option is the “front door” method. When somebody does `www.company.com` they get an excruciatingly plain page that comes up in a snap that says, “High speed, medium speed, low speed, you pick.” And they don't even get a company message.

There's a little logo at the top that says they're headed in the right direction, but yes, you're forcing them into another click. It's not going to make them that happy, but if they're a common visitor they will bookmark the second page anyway or whichever second page they choose. It will always be thus, because next week we'll always be putting in extensions that nobody else has, because that's their method and it's how they're maintaining market share.

[Tape change]

M: [inaudible]

Jim Sterne: Some of the browsers announce themselves, like *Netscape* and *Enhanced Mosaic*. They send along information that says, “Oh, by the way, this is who I am.” And if you have a script in front of your Home Page it can say, Welcome, *Netscape* user, here's the nifty page.”

So you can do that with some, but you're not going to know unless you read the domain name who's coming from AOL — its browser doesn't announce itself yet. So you can automatically make some choices, although I think the *Air Mosaic*, *Enhanced Mosaic* is probably the closest to *Netscape*. They're trying to keep up in terms of handling all the extensions, but Oracle just announced a new browser yesterday, and we don't know what extensions they handle.

Keeping up is going to be really tough to do, especially when people start going off in different directions where — oh, it says Microsoft, we want you to try to keep up with us and different things the *Netscape* does. Now, you definitely have to do multiple development. It's like UNIX was — you create a piece of software and you compile it for this UNIX and that UNIX and it runs all over — no way. You have to go in there and tweak code to make sure that it will run under the different operating systems. You've got to tweak code to make sure it operates on the different browsers. And I say let the customer self-select.

[The Internet is a] two-way street, not a broadcast medium. You have just put life, soul and all kinds of additional resources into putting up a really nice Web page — making it fun, useful, easy to navigate, and full of good information. Get something in return. Make them pay a little bit for that. By that I mean with a currency they have, which is, number one, their time. If you do a good job they will pay you with their attention; and if you do a really good job they'll also pay you with information about themselves.

I usually recommend that people set up three-tiered or more levels of stuff that's available on that one site. The first tier is to attract attention and get people to show-up — it's free and available, come and look around, the front door of our store is open.

The second level is, "Here are some really nifty things that a lot of people would like, so in order to get at this we want you to reveal some information about yourself. Maybe we'll go all the way to name and address because we want to put you on our direct mail list and send you junk. But, also, we want to know how you feel about these products; we want to know how you're assessing the system and whether you think it's fast enough, to give us feedback about our Web site." Make them reveal something about themselves.

The third tier is real, live, important, valuable information — whatever it might be for different companies. It might be a report on a survey that you've done recently; it might be not just the white paper but the extensive concepts and facilities, or something which you want people to actually pay for.

A lot of us are in the information industry, and you publish that and you get people to actually come up with dollars for it. So there's the free stuff. There's the "give us a few answers and you can have this." The worst case of this that I saw was CNet. You've seen CNet on television, a new show with Richard Hart. They have a monster Web site — interesting stuff, but when they first went live they wanted you to register, they wanted to get your e-mail address. In order to encourage you to register, if you did then you could download the 4-megabyte computer animation of the Brown/Goldman killing. It was gruesome, just astonishing bad taste. Their servers were overwhelmed by people registering and downloading it. Unbelievable.

Here's a neat example. Everybody knows what to do here — it's a business reply card. I like it because it's familiar, all the way down to the "no postage necessary if used through the Internet."

Here is... I don't know if you remember the DealerNet car giveaway, but they did something interesting. Yes, they wanted name, address, e-mail or they wouldn't know where to send the car if you won; and then they wanted a little bit more information — the year, make, and model of your car.

Now, if I had the opportunity of winning a new car I would take an hour out of my Saturday and go down and test drive it and put my name in the barrel. Year, make, and model — that's all they wanted. It takes seconds to fill that out. Think of what they could have asked: when was the last time you bought a car, how many miles do you drive a year, how long is your commute, how many drivers in your family? Instead [it was] just year, make, and model; and oh, by the way, are you 14th floor or lower, 28.8 to 256, or more than 256 for access? So, can we use big pictures or not? And then would you like to subscribe to DealerNet's upcoming monthly mail newsletter, *The DealerNet Report*? And notice the default is "yes."

They have your e-mail address because you had to give them that. Now they're asking you if it's okay to send you marketing literature? Pretty nifty. If I'm in the market to buy a car, yes, I want their monthly report, I want to find out what's going on in the car industry for a while to get up to speed. But I guarantee you that the person who says they drive a 1968 VW Microbus gets a different newsletter than the [person who drives a] 1995 Mercedes Benz. It's the targeted marketing, the one-to-one marketing, the personalization.

Mama's Cucina, the Ragu folks, have about 45 questions on their survey and you don't get anything for it. It's just a survey; there's no prize, no contest, no sweepstakes, just "please answer these questions." How often do you eat pizza; how often do you cook it at home; how often do you order it delivered; when was the last time you bought pizza sauce in the store; how much did you pay; how many of our competitors' products have you tried; what do you think about them, on and on and on.

I called up and I talked to [Alicia Rockmore] and said, "Surely, you're kidding. People aren't going to spend five to ten minutes answering all these questions." [But they've been] overwhelmed with responses. People like the site; they think it's warm and friendly and they're willing to spend their time. They know that this is the way they can say thank you. If I like this site and buy a T-shirt, it sends a signal to Ragu that they're doing the right thing.

They said that the information that they're getting — yes, they recognize that it's statistically unscientific and it represents self-selected people who are willing to fill out surveys on a Web site. Okay, but there's enough good information. When 95% of this little skewed audience has the same opinion, chances are that's pretty representative of the rest of the population.

Chances are they ought to make their pizza sauce a little bit thicker to compete against their major competitor; and they said they've already started rolling some of that information into their product plans because of the number of responses that they're getting. The depth of the information that they're getting would have cost them hundreds of thousands of dollars in focus groups; so if you do a Web site right people will pay you back with their information.

There's another way that it's a two-way street at Mama's Cucina. This is Mama's favorite places; at any other Web site, when you see the button that says "Our favorite places," you know you're going to go to a blue page with that list of other sites on the Internet that we like, and we'll see you later. This is Mama's favorite places in Italy, where she has gone recently and stayed in a nice hotel, had lunch at a nice restaurant — and by the way, have you been to Italy recently? We want to hear your story.

Next time you go, you can click on "Milano" and look at 10 or 12 different versions of people who've been there in the last couple of weeks, and they say, "Around the corner from the fountain behind the barbershop there's this really nice trattoria, they have great linguini, ask for Giuseppe and tell him I sent you." You can't get that out of *Froemmers on Europe on \$150 a Day* — I don't know what it is now. You get this and it's real current, and it's a way of asking the audience to participate. If I added my restaurant review to this Web site, it's built the loyalty bond real strong because I now am a publisher on their Web site.

Then she asks you to answer. "Mama, write to me when Ragu offers coupons in the newspaper or features new items on the Web site or introduces a new flavor or product." You enter your e-mail address and your name. I am not only agreeing to accept marketing literature, but I'm telling her what kind of marketing literature I want. So, yes, I checked that I want to be notified when the Web site is updated. And the announcements are really cute. "Yooohoo, it's Mama from www.eat.com; we've added some really new stuff. Come and see it. We've got this, this and this, and we're really looking forward to seeing you again, just remember to wipe your feet."

It's not only a two-way street, but if you're starting to collect information about people you can personalize it for those people. As Chris talked about, Bank of America had "build your own bank," a very powerful statement on a Home Page. I'm going to configure their bank to satisfy me.

Here is an area that I'm slightly interested in at this moment — a bookstore on the Internet. One million titles come in; search our stacks, search our shelves by keyword, author,

title, subject. Use our full-featured search form, use our search language — for those computer scientists — to look at the award winners and the bestsellers and read customer reviews.

So you're not just stuck trying to figure out what the *New York Review of Books* said; you can see what the average person who has Internet access and a Web browser thinks about those titles. And by the way, here's some staff favorites by category, so you can see what the people who work there read and like.

If you do a search on Internet marketing you might find my book, which you can add to your shopping basket, but also you can look for similar books by the following subjects: Internet Marketing, WorldWide Web information, Computer Commerce, Computer Networks, and General Marketing. Click off which ones you want and hit the button.

If you're in the store and you go to the front desk and you say, "Where's Jim Sterne's book?" They'll say, "It's over in that section." And you go to that section and say, "Oh, look at all these other books in the same category with the same subject matter." It's hard to do that on a Web site, but they've found a really good way to do it. Find the book you're interested in and say, "Yes, I want to see others that are like it."

There's also the personal information service so you can go here and say, "Gee, I want to see other subjects on Internet marketing. Here's my e-mail address — any time a new book is published that falls into that category I want you to send me an e-mail." This isn't marketing anymore, this is — I'm really interested. This is a service. This is valuable to me. I especially want to know if an author named Jim Sterne publishes a new book — I'd like to know that first. Well, maybe you want to know when the next John Le Carre comes out, or you want the next Tom Clancy; they'll tell you and boom, it will come into your mailbox. It's personalized.

This is just the beginning. We are able to take the next step, which is: "Good to see you again, Dave. We know when you were last at our Web site because you logged in and identified yourself. We know what you haven't seen since you were last here, and we can create a page on the fly to show you the new stuff. We know what products you're interested in because last time you looked at the band saws; well, this time we're having a sale on hand drills. Maybe you'd like to take a look at that."

"Here's some information on your investment portfolio," if we happen to be your bank. "We can go out and instantly fetch the latest stock quotes and show you the results, and it's personalized to you."

"Here's the status of the order you placed several weeks ago, on-line, accessing the glass house data center and supplying the information." America Online already does this: "We notice that you're using an older version of software," and boom, download the new version.

Let's allow the user to create their own Web site for their own purposes. So make it fun, useful, or interesting; easy, fresh, targeted; a two-way street, and personal because this is your Web site, this is your Web site using those six rules. Are there any questions? Have you heard it all before? Does this all sound familiar? Some yes, some no. Well, let me ask, because I'm curious, what kinds of things can you offer your customers? What might you do on your Web site that is a service to people? Somebody raise your hand.

M: [inaudible]

Jim Sterne: So I put in the kind of car that I have and my zip code and you'll show me the dealer where I can find the particular car battery. That's good. If I'm interested in buying a car battery I might just have the guy at the local gas station do it, but you know I'm going to pay twice as much for that than if I just go to the store and buy it myself. I can go learn from your Web site which kind of battery is going to work best in my car and where I can find it. That's a good one. Who else?

W: [inaudible]

Jim Sterne: So if I log in, I can see a couple of choices. First of all, what on earth is an HMO these days? They change so fast. Is my doctor in your HMO plan? Everybody wants to know that one because if you switch plans, geez, am I going to get to keep my doctor? That's information that you can keep absolutely current. I don't know how many times I've gotten a little booklet, called them up and they said, "No, we're not anymore." So that's vital.

I think your idea of once you have somebody enrolled and you know their medical history, you know the things they're going to be interested in, you know that when you create a menu of options, you can look at their customer record and say, "We'll weigh these things differently."

They're going to be more interested in this ailment and this remedy, so we'll put those at the top of the list. That's a nice way to do it. Also, in health care you have a grand opportunity to create communities of people. I don't know how many stories I've heard from folks who have gone to the Internet, which is a splendid place for group therapy. Unfortunately, it's not managed — it's just a bunch of people who have common problems talking about them, which is a fabulous tool.

I'm not saying we're going to put therapists out of business, but support groups are fabulous out there because you're behind the safety of your terminal in a room of strangers, and you can really pour out your heart — these are the problems that I have because of this condition. When somebody else from somewhere else in the world says, "Gee, I had that experience too, and I found this worked for me." Wow. And now they know that they can find that on your Web site. Very powerful, very useful — that's a gift out to the community.

W: [inaudible]

Jim Sterne: Mediated discussions are terrific, but are labor-intensive because people like to talk; you're going to find that you have to be there kind of on a twice-a-day basis to see what comes in and filter which ones you're going to post. So make sure that you've set aside some resource for that before jumping into it. If the response is really good, you're going to have trouble managing it.

But if you do, and if I'm one of the resources that is managing this discussion — it could be product information, product feature discussion group, any kind of focus group on the Internet — if I'm responsible for managing it, and something pops up that I'm unsure how the company wants to respond, I can forward it to the right department head. If it's a technical issue or medical issue I'm not sure about, I can forward it to a participating doctor and get the right answer and get it back quickly. That's wonderful. It's a two-way personal communication medium. It's a great thing to do on a Web site. Who else?

M: [inaudible]

Jim Sterne: I've heard that one of the most popular things out there are people who form [groups] around collectibles — I collect Elvis stuff or I collect glass paperweights, I collect Barbie dolls, whatever. And even if it's a little tiny subject matter you can find a lot of people who are really interested in it. If you're keeping track for me that I'm interested in the potential of picking up distressed properties, that's a real service to me — you're a clipping service, but even more so. You're not just looking at the news, you're looking at the marketplace for me

and making me aware of potential deals and hopefully taking a cut off the back end. A valuable service.

Okay, who here is having a lot of trouble thinking what you might do to make your Web site special? Over here in the corner.

M: [inaudible]

Jim Sterne: A commercial real estate builder. Nothing exciting or new or fun you can do in real estate?

M: [inaudible]

Jim Sterne: This developer puts up a Web site. Who is the audience? Are we looking for buyers or for investors? We're looking for people who are going to buy these houses. Okay, well, the first thing that comes to mind is that you'll want to get on a public relations campaign to seed all those places out there that are real estate-connected so that people know that the want ad shows up that they click on. It says, "Oh, there's a house in this particular geographic area, now come and take a tour of the house. And by the way, we have 12 units that we haven't started yet, and we're willing to let you configure them specially — here are the floor plan options, you can move this here or that there. Go ahead and click around and create your own home." That would be fun.

"Here are some trees you can plant around it." In fact, I don't know if you've seen that landscape piece of software where you specify the plants that you plant, and you see it five years later and ten years later — that would be a kick on a Web site. Custom design your own home in this building development; landscape it on the Web and decide what color you want to paint it, what kind of roof you want to put on it. Get them to own it before they've even talked to the sales rep.

M: [inaudible]

Jim Sterne: Absolutely, put in support for financials. Here's something that I've seen a couple of companies do. If I were a real estate developer I wouldn't want to put a lot of time into writing code that would do amortization schedules, because it's not real straightforward and simple. There are a lot of Web sites out there that will do that. But I've just opened the door for them to go bye-bye. Instead, what I've seen happen is that the people who do the calculations provide the code that lives on your server — "properly identified and brought to you by, courtesy of" — and you can go there if you want to, but you can stay here and do the calculation and go back and look at your new home. That's a good one.

M: [inaudible]

Jim Sterne: Pre-qualify to make sure that you're financially capable. You're pre-qualifying the folks that can't afford it, the folks who want to do some different kind of financing. The other thing you might hook in is relocation services. Why is somebody going to buy a new home? Maybe because they have to move for job considerations, but what else? Tell me something about the geographic area; I want to know what the schools are, what the local government is like, and if he doesn't have developments in every part of the country then that's not an overwhelming task. Otherwise, it is.

M: [inaudible]

Jim Sterne: Auto insurance — yes, a necessary evil. What is your product positioning? How do you differentiate yourself? What do you offer?

M: [inaudible]

Jim Sterne: So you're limited geographically and you're regulated for price. So what distinguishes you from your competitors? I like the sound of that — customer service. It just rings a bell.

M: [inaudible]

Jim Sterne: So geographically you're regulated for price, you can only sell through agents, and you provide really great customer service. When I buy insurance what I'm focused on is what's the minimum I think I need to have so I don't have to spend too much; and I never ever think about what would it be like to actually have to use the service. What's it like to have to write an insurance claim form? That's like thinking about putting together your funeral service — I don't want to plan for having an accident.

I don't want to plan for having my house burn down. Besides being traumatic, it's difficult. So if you provide some information — hey, it's easy to work with us, here are the steps, here's what we've done for others, here's a picture of the van that will come to your house — you help to educate people. But I'm still trying to think of some technology — we've got a room full of expert help out here. You're buying insurance, what do you want to see?

M: [inaudible]

Jim Sterne: Especially in a regulated state. I would suggest that you hook up with the real estate guy — are you real estate people in Massachusetts? Darn, because relocation services... You're going to need different insurance.

M: [inaudible]

Jim Sterne: And if your agent is not on e-mail there is software out there now that, instead of sending an e-mail, it will print it into a fax — and your agent definitely has a fax machine. We know that.

M: [inaudible]

Jim Sterne: I'm going to put in my zip code and my home address and then I'll get specific rates back on car insurance for me. Plus, the other thing that I get in the mail every six months from my insurance agent is the update questionnaire. By the way, is your son driving now? Does he own his own car? Have you added on to your house? Have you made any physical improvements? It's just the way of going through and saying, gee, am I insured enough?

I can tell you that in Santa Barbara several years ago, and Oakland a couple of years later, there were large fires, and, of course, we had the earthquake down in Northridge. I can't tell you how many people bought insurance and put it in a safety deposit box and forgot about it, and when it was time to rebuild their home their insurance agents told them, "I'm sorry, you're only half insured because the value and price of homes has gone way up and you didn't keep up to date." If I'm an insurance customer that would be something valuable for me to do

— my own self-analysis when I was sure the agent wouldn't call me or pester me. I'll take a look for myself.

M: [inaudible]

Jim Sterne: That's interesting. There may be auto dealers that are on the Web, and wouldn't that be interesting to hook up with them? If I'm looking at buying a car — by the way, check out what my insurance would be. Gee, should I buy that Ferrari? Yeah, I can afford it but I can't afford the insurance.

M: [inaudible]

Jim Sterne: Ooh, actuarial information, accident information. Also, give me a button to click on the *Kelly Blue Book*, because if I'm buying a new car I'm probably selling my old one.

In order not to keep you here all day, we're going to move along to the next segment. Chris, do you want to regale this audience with some of your views of what's going to happen in the future?

Chris VandenBerg: There's some interesting topics, things like the standards bodies. There's a lot of talk right now on the standards bodies. Do we need to come up with a new mechanism or do we just use the old mechanisms, like the IATF? What are the benefits? Is there an upside and downside to anything? Are those organizations dead? I certainly wouldn't propose that they are, but things are changing rapidly; not necessarily by groups trying to control the way they're changing, but trying to push. Is that a bad thing?

That's probably one of the things we should talk about. I'm sure people have opinions. If you're a developer, one side says, "Gee, I'd really like to know what all the standard things are, so I know what to support. I think that's certainly what Mike's faced with. But you also want to show the coolest thing, and if somebody else has a tool set that supports a cooler thing than you can show you're going to say, "Gee, I want to support that."

There are a lot of dynamics to this whole thing — and what's the right way? I don't think there is a right way, but I think certainly there's going to be a lot of opinions. We're going to make this the opinion session, but I guess the goal is that the three of us have opinions. I promise you that we don't agree on everything; that would be really scary. But I guarantee that's not the case. During this session, if you want to slam things that Microsoft has done, fine, as long as we keep it on a factual basis, I'll discuss it.

The "registration wizard" does not steal your machine configuration, okay? I'll put that to bed right now. It doesn't do that. Okay, seriously, I just want to have a good discussion. That's why I came 4,000 miles — to have a good discussion. There are things I want to talk about, but I don't want to keep it "Microsoft-centric." I want to involve these guys. They have some really good ideas, and we've had some good discussions.

Can we do that? Is that realistic? I am going to try and make some people mad with some of my slides, because that always starts the discussion going well. Actually, why don't we try to envision a thing like the McLaughlin Group, where they say, "We're going to sell out — predictions, Eleanor?" We kind of do that kind of thing right here, where you get two minutes to sum everything up and it's usually very outrageous.

Predictions. We talk a lot about the U.S. — we're very "U.S.-centric." We, as a company, have kind of a typical view. By the way, and this is anecdotal certainly, we come up with an application for the U.S. and sell it all over the world saying it's a global application. That's a limited view, and we're trying to get much better. In general, though, there are a lot of

trends, as I alluded to this morning, to expand the Internet and use it as a national competitive advantage.

Countries like Singapore — everybody thinks, “By the way, in Singapore the Internet is censored.” I’m here to say that that’s not true, folks. Somebody’s kind of presenting the view that they want to hear. There are three Internet providers [in that country], and they view it — the government is investing in the infrastructure now in a huge way, and they believe in making sure that the parents enforce certain standards. But the point is, yes, you might say it’s an oppressive society, but they view the Internet and communications as a very fundamental competitive advantage.

I’ve seen that [situation] replicated in other areas of the world. Does anyone right now have an application or a use that you foresee, or you’re counting on this happening, for trying to reach globally? Today I think we assume that the rest of the world has the same connectivity as the U.S. Sorry, it’s not the case, and if you’re assuming that then you have an incorrect assumption. It’s still expensive everywhere else. This thing about Europe being one harmonious area and everybody loves [each other] — that is bull! They hate each other. It’s all monopolies. That’s a strong statement. They are trying to protect their monopolies, and whether it’s Germany or France they still are keeping up the status quo, or they’re trying to. That’s going to change to a certain extent, and the Internet is driving a lot of that change.

If you’re counting on widespread connectivity, I think you’ll be in better shape in ‘96. I was at the Telecom Show, which is the big show in Geneva every four years, and they spent 35 million dollars on booths. Just the booths. These are the big companies. IBM spent a bunch on theirs, too, but that’s another story. Everybody was making IP announcements — dial-up IP — which was very interesting. Four years ago nobody would have foreseen that.

Is anybody looking for that kind of connectivity or counting on that? And if so, when? Are you trying to extend your reach globally? The Internet makes it a lot easier, as long as you have a [inaudible]. So you’re trying [for] leverage. How would it help you?

W: [inaudible]

Chris Vandenberg: China — there are huge efforts right now to bring the Internet to China. In many cases, though — in Eastern Europe the phone system is miserable and they use the Internet instead of phones because it’s more reliable. That’s kind of an interesting concept.

W: [inaudible]

Chris Vandenberg: And what language do you want it in? Localized content is a big issue in Europe right now. It will be very interesting to see if America Online is successful going over [to Europe] as America Online. Their president for Europe went over and did a speech in Geneva where he announced boldly that America Online was coming to Europe. I chatted with about 10 Europeans who said, “Why don’t you go on home? We really don’t want you over here.”

M: [inaudible]

Chris Vandenberg: There are a couple of competitors, but the point is that I got a real sense from the European folks that I talked to — and they came from a wide variety of backgrounds and interest levels — that they wanted European content that had relevance to them. There’s some global appeal to things — maybe *Hot Wired* appeals to everybody — but local content is really where they saw the majority of people in their country spending their time.

If you're trying to develop content that you envision having global appeal, you almost need to start thinking about localization from a language standpoint, but possibly even [from a] distribution [standpoint].

If you have subsidiaries in other countries, you need to start to think about running that content in those countries. The international line costs of running Internet service, by the way, are typically 40% to 45% of the cost for running an Internet service. In the U.S. we kind of think it's free — you know, the backbone is just kind of there and it just works. But it's a much lower overall percentage of the cost.

Internationally, Australia is two million bucks a year for a T-1. That really hits the bottom line of an Internet service provider. So if you are thinking about that, that's something to bear in mind. There are going to be a lot more people on-line, so I predict you'll get a lot more eyeballs from places that you didn't envision.

You may find appeal for your information and your product that you didn't think you were going to get, and you have to choose whether you want to respond to it. Certainly, if you're going to engage a customer base overseas that's a whole different proposition.

M: There's the thought that English has become the language of commerce around the world, and now it will be even more so.

Chris Vandenberg: Well, I wouldn't bet on that. I think you're making a big mistake if you're going in with a business plan that says that. Microsoft's number two market is Japan, after the U.S.

M: [inaudible]

Chris Vandenberg: I don't even know, to be honest with you, I just know that they are number two. I'd rather tell you I don't know than make something up. It's a very large market. Internationally, it's split pretty evenly between domestic and all of international, so it may be 10% or 15% — a good chunk of 6 billion dollars. But I don't know what the figures are. And they do have some localization, but I guess I'd have a question for those of you developing: do all the servers support double-byte character sets yet?

M: [inaudible]

Chris Vandenberg: Good point. You might want to check on that if you're serious because it's really hard to do that without double-byte character sets.

[Tape change]

Chris Vandenberg: That's a good point.

M: [inaudible]

Chris Vandenberg: I would think [in terms of] publishing, though, that there's an opportunity here because if you were doing physical distribution — as Nicholas [Negriponte] says, “atoms versus bits” — the costs for international distribution are huge, and the barriers of shipping are, too. Or if you're going to establish a satellite-based distribution system for the content, it's huge.

Transporting bits is pretty cheap, so it may actually offer the opportunity for publication if they can be successfully localized — and I'm not minimizing that, [because] that could be a ton of work and they're a very tricky challenge. But if you can do it, the distribution barriers are really a lot lower than having to have trucks rumble through the streets of Paris. So that's something to consider.

Prediction two — we've beat that one to death. I know, you spend a lot of time on [inaudible] and you're really upset. I believe that this is going to happen, and I hope that we have a pitched discussion on this. Those of you who are good at it, that's great, you may be able to still extend that, but I think that ultimately you're going to have a choice if you want to continue to spend your time understanding the internals or doing really cool things with the tools that are provided — assuming they meet the need, and if they don't meet the need you'll still end up doing it yourself.

[Panel]: We're not writing in Basic anymore because we have wonderful tools for doing Visual Basic, and we're getting to the point where if you can drag and drop stuff everybody will be able to create their own Home Page. But you still have sophisticated capabilities behind it. We're with *Java*, and with the new tools that are coming on — yes, you need to be a programmer to put together a solid Web site that can deal with the data that's coming in and then shoot it back into the database and the corporate data center. Yes, the HTML, the “what does it look like” is going to be a piece of cake. But all the back-end stuff, which is what's going to make a great Web site, is still going to require programming.

Chris Vandenberg: For the component integration, I wouldn't disagree with that. I'm talking about the authoring environment.

M: [inaudible]

Chris Vandenberg: There are, in fact, several approaches. Once again, I'm not going to sell anything, so you decide what's appropriate. But there are several approaches. I mean, *Netscape* is looking at their [inaudible] to provide a scripting capability.

Java does some neat things, but it doesn't do everything. And if you read the papers, *Java* is like the Second Coming. I'm sorry, that's crap. It's an interpretive language; it may download some components, it does some things very well and it's a really neat idea... Jim [Gossling] came up with some great stuff, but it's another thing, it's another cool thing, but [just] another thing.

M: [inaudible]

Chris Vandenberg: I think all the solutions are being envisioned to essentially have components that get downloaded to your machine to do really cool things at that time, and then away they go. And your environment has some control over them. There needs to be some kind of — Jim and I were carrying on this e-mail dialogue about this. There almost needs to be like an object library of things that have been imbedded and tested, and we know these things are not Trojan horse material. They're sent over in encrypted methods with full end-to-end security, but there's a bunch of models, and the marketplace will make the choice.

M: [inaudible]

[Panel]: It's got to have three things: it's got to be economically viable to validate and shift in code [so that it] is secure; it has to be really fast; and it has to be invisible so that there is no mental overhead [inaudible].

Chris Vandenberg: Yes, the user shouldn't know anything about it other than maybe making a choice whether they want to allow it to happen. But there's an analogy here; has anything that's happened on the Internet to this point killed shareware? There's still a bunch of really good places where you can go out and download shareware. you know the risks and you make the choice, or you can go down and buy it from some place. I don't see those grass roots developers — they're not going to go away. It's just "let the buyer beware."

Or if you want to run through some kind of a certification program that you run, or that Sun runs, or we run, then we'll bless that and our reputation will go with that chunk of code — whether it's an OCX or whatever, [and we'll say], "this will not blow your machine up, and this will not steal from the registration wizard all the stuff that we said we weren't taking before." Whatever — it can be handled in a lot of different ways.

Michael Bauer: Does that mean we're going to get an HTML headstone for the computer museum?

Chris Vandenberg: No, that may still be the underlying mechanism. That's not the point. It still runs HTML; the question is, do you have to know it?

Michael Bauer: Well, who are "you"? There are lots of different "yous". You as the contributor aren't the developer.

Chris Vandenberg: I believe, fundamentally — Mike and I [both believe this], and that's why he's very good in his company — it is very well going to mean having fundamentally different view of how to approach technology. To me, technology is like razor blades; for him he shaves with it. Me, every time I touch it it cuts me. He's good at that; he's mastered it so that it doesn't cut him and he's turned it to his advantage. Certainly, that's what his company is very good at.

M: [inaudible]

Chris Vandenberg: Six months to a year, a year on the outside. I mean, it's one thing to have one company do a product, but then it's another thing to have people accept it and all that stuff.

M: [inaudible]

Chris Vandenberg: Because if you can pull in objects — whether it's *Java* applets or OCX is really irrelevant — if you can pull in objects that other people have developed to do really cool things, if I can pull in an object that does [something like] pick the hot thing on the Web today... What's the coolest thing that you're seeing today? Maybe in-line-streaming video. If I can just drag in an OCX control or a *Java* applet that provides streaming video, I just drag that in and I don't care about the underlying mechanism, and I don't need to touch the technology. I can just design. As a designer, I think in terms of functional blocks. I don't care about the plumbing underneath; I assume it's going to work. And these are developed by a wide variety of third-party developers that know the details and make it work.

Maybe your group is one of those that says, "Okay, we have expertise in these five areas and we're going to develop these little object modules and then resell them. That's great too,

because what you're doing there is passing your value-add to people that don't want to replicate it, or can't.

M: [inaudible]

Chris VandenBerg: It will take a while, and it's not just the product — it's the training and getting people to provide solutions. The technology is fine and dandy, once again, as long as it solves the problem.

Michael Bauer: *Netscape* has picked a number — 70% of the market — of a very small market that is very anxious to be the first one using it, and the rest of the market has got to be 9 billion people who don't have anything yet, but are waiting to do the same once the product has proven itself. [These people have the attitude], "Before I get involved I want to see something is going to be around for a while."

Chris VandenBerg: I mean, for Mike and his company I can understand the dilemma of choosing. You've almost got to — because of limited resources, (well, everybody has limited resources) — you've got to make a wise choice in where you're going to develop. It's hard. The market is immature at this point, and it's a crashout.

M: [inaudible]

Chris VandenBerg: Until the market makes a choice.

[Panel]: The market did make a choice, and Windows basically won out, and now we're going to replay that whole thing again in the browsers.

Chris VandenBerg: Because the market wants to make another choice.

M: [inaudible]

[Panel]: Yes, but now the Internet no longer belongs to technologists and to standardizers. It belongs to the marketplace. And the marketplace is going to go with *Netscape*, even if it's nonstandard, because it's the coolest, latest thing.

Chris VandenBerg: I really want to push back on this point, having been involved in the IATF and Internet standards process on more than one occasion. There were RFCs published for informational purposes, and if 10 companies took it there were 10 implementations that were done. The first time they plugged in they didn't work — we had to get together and do bake-offs. But after you established the base-level functionality you could still add your own thing.

There's kind of a "lowest common denominator" functionality. The standards process is there to ensure that level, and then everybody still enhances and optimizes and differentiates their own way. If they're successful in the marketplace, they can build critical mass and then they can dictate — that's a strong term — they can say what they want the standard to be. And once again, what do you do? Do you say you're going to wait for the company with 1% market share to try and coordinate with us? It's a difficult question.

M: [inaudible]

Chris Vandenberg: Anytime you put content out on the Internet, whatever that content is, I consider that authoring.

M: [inaudible]

[Panel]: I think of authoring as experiencing, not just the content. You're developing an interactive [inaudible].

Chris Vandenberg: [I have a] closing comment on that: design and content don't have to be linked. I can have a very rich design and a nice library of objects, and then the content changes on the fly. Today we're kind of hacking our way to that, but that's because, fundamentally, the protocol and the tool set went in with that assumption that they were linked. It doesn't have to be.

Number three — and this is actually kind of my favorite — yes, people will make a lot of money, but they won't do it by becoming ISPs and putting their foot up on the Rolls Royce and saying, "I made millions of dollars, don't you want to, too?" They'll work hard. They'll come up with really cool, innovative ideas, like with Mike's company, like what Jim's doing. They'll add value. They'll earn it.

Everybody seems to be looking at this whole Internet thing. We actually have a really interesting video I tried to [bring], but it's so good that they only let Bill use it. It's called *The State of the Art*, which we did actually for the analysts because they kept saying, "What's all this Internet stuff? What's Microsoft doing?" It's really good because it has clips, like Bill saying, "Anybody can make millions in the Internet — I've done it." Things like that. And then it's got Spielberg and Katzenberg and those guys saying, "We did it, too," and that kind of thing. And it's actually very funny.

But the point is, if you add value in places and you can build a viable business model, you'll make money at this stuff — or your company will be more productive, which adds money to the bottom line. There really isn't any magic about it, and it's just kind of amazing that all these people are flocking in now saying, "What's the thing here? What's the mystery about all this? Where are we going to make our millions?" It's the same thing you've been doing, adding value at the right places with a good business model.

[Panel]: Think about if direct mail suddenly happened; now we all have a way of [inaudible]. We can all go out and get rich right now; we're all creative. There's a fine art to creating good direct mail. Same thing on the Internet, no different.

Chris Vandenberg: I'll turn it over to you guys now.

Jim Sterne: The first [prediction is] by Nicholas [Negreponte]: By the year 2000 there will be one billion people on the Internet. I like the keynote guy from Sun; a couple of days ago he said, "The new-generation IP address system is going to allow for 1,625 IP addresses per square yard of the planet." That ought to be enough.

I like to quote Mark Gibbs, who is an Internet guru and author who said that when [Elvis] died there were 43 Elvis impersonators, and today there are 43,000 Elvis impersonators. By the year 2010 every third person will be an Elvis impersonator. Then one of my favorites [is from] Michael Bauer: "By the year 2020 there will be more computers on the Internet than particles of matter in the universe." Thank you, I use that all the time and everybody agrees.

Okay, so here's the short-term/long-term. E-mail in the Web will be expected from you, and all services will be combined. Let's go through these real quick... The services will be

combined: you're going to see the browser have the e-mail, have the Web access, have the audio, have the video. If you've been by the Netscape booth, you know this is old news. So much for short-term predictions.

[With] VRML we'll be able to graphically go out and 3-D our way around; and if you can figure out a way that being 3-D adds value, I want to know about it. Of course, this job — we all know that's exciting. The coffee cup can jump around, which from a marketing and grab-your-attention perspective is good. But again, I've got my ears wide open and I want to hear about applications, because I think that this kind of imbedded programming is a good thing. I think you can put a spreadsheet on your Web page that I can type in my age and it will tell me what my insurance is going to cost. So I'm interested to hear what people are going to use that for.

M: [inaudible]

Jim Sterne: Right, so it's a neat technology that's fun to look at. But if I'm trying to buy something and it's keeping me away from the product, it's slowing me down. So that's a personal problem I have.

[With] imbedded access, I think browsers are going to disappear. It's not going to take very long. In Microsoft Word, if you click on the imbedded URL, it becomes the browser. Excel becomes the browser — your browsers are going to get imbedded in all of your applications.

[I also have some] "Help" and "Clip Art" examples. If I click on Help, instead of going to the five megabytes of Help on my disk I want it to go back to headquarters and take my last 25 keystrokes with it, so it can come back and say, "Oh, well, you jerk, this is what you did wrong." And I want it to give me the latest help.

Now I also think that access is going to be imbedded. If you saw what Quicken has just come out with, their latest release has Internet access. And you know that's old news, too. So if everything's changing so fast, if there's new technology all of the time, if there's no standards, why should I do this stuff now? The answer is because you've got to learn the human side of it.

You have to know who in your organization is going to be responsible for doing it. What is it like interacting with people electronically? It doesn't matter if it's through the cable TV or if it's Internet, or it's interactive or whatever — relating to people through computers is now happening, and there's a lot of the human side of it to learn regardless of the technology.

It is going to open up the company so that people are going to expect access to your data, and to their data, to your data about them, to your processes, your procedures, your policies. They're going to be able to instantly tell the boss that you did something wrong; you're not going to be able to hide behind your desk anymore. It's going to be an interesting world.

As I mentioned earlier, we're going to have the ability to personalize it. And that's really where we're going to end up with this thing — where you're going to get nine-tenths of the way through a customer service interaction and the computer-generated person on the screen is going to say, "Gee, you know what? I don't know. Let me go get a human being."

We want access to policy. I want to know why your company has policies that keep me from doing business. Why did I have to wait so long? Why can't I have this order split up the way I want? Because if I call up and I say I need 200 of them shipped tomorrow and the answer is no, I want to know why, because maybe the answer is that you asked for blue. "If you want it in green, you can have it tomorrow."

"Oh, great, I'll take it in green." But you've got to provide that kind of answer to the "why" questions for people.

They want — they being the public and your customers — and are going to expect to have an impact on your product decisions. They're going to expect to be able to say, "Gee, I'll

pay more if I can get it sooner; maybe you'll change your production schedule for me." That will happen automatically; it will come into your system. Benetton Clothing stores looks at what colors sold every day and uses that information to determine which dyes they run the next day in the factory. That's going to happen in a lot more industries.

[I want to mention the issue of] personnel evaluation reporting. If I have a bad experience with somebody on the phone, I'm going to send off an e-mail to that person's boss, like now. The corporation is going to open up and your customers are going to become a lot more like stockholders, and they're going to insist that you change the way you do business if you want to continue doing business with them.

You get into science fiction. Long-term, you'd all be at home right now with your 3-D goggles and your stereo headphones; but now we get into some difficult problems. If I look into a camera, it looks like I'm looking right at you. In this situation, if I move my eyes a fraction of an inch, you know I'm not looking at you anymore, I'm looking at [another person]. And you can all tell that this is tough, difficult technology, but we're going to get there. It's going to be this experience where you can go off in the corner with people and chat about it over a glass of water and then come back and sit down without leaving home.

Finally, [this is] my prediction on top of everything: by the year 2055 everything that can be connected will be. Anything that has a chip in it, anything that has any battery in it will be hooked up. I can safely say that because in 2055 I'll be 100 years old, and if I'm wrong you all can come and tell me.

W: [inaudible]

Jim Sterne: It will become more and more inclusive over time; it won't happen fast. You remember rural electrification, where people had to spend lots of money to run electricity out into the farm lands because they were left without? It's going to take a while. There's a lot of fiber that has to be laid to support that, and there's a lot of equipment. We heard this week about the \$500 computer — that is, the Internet computer. And if that's the case, and if that works, then that's going to enfranchise an awful lot of people. If it doesn't work it still costs \$3,000 for a computer, and that's going to keep a lot of people off.

M: [inaudible]

Jim Sterne: And on top of that, the day after tomorrow there will be a new manufacturing process that we cannot envision that will make it all so much cheaper that it will be silly to do without. We don't know.

M: [inaudible]

Jim Sterne: And therefore, from the marketing perspective, is my marketplace able to get on the Internet? Not "are they?" — because chances are they're not yet. But if they're capable and it's possible for them, then it's my responsibility to offer them something that's so useful that they will get on the Internet just to interact with my company. And then, "Oh, by the way, here's all this other neat surfing stuff."

But I'm going to offer them electronic data interchange that's valuable enough for all these neat resources. I don't care about the "Information Superhighway," but if I can track my Federal Express packages and I'm the shipping manager at my company, I'll get on the Internet just to do that. [Then it's], "Oh, look at all this other neat stuff."

M: [inaudible]

Michael Bauer: I think the Internet is like a language for communicating with people. It's a universal language, and everybody's just sort of starting to speak the same language, so there's a lot of value to that. But I also think the Internet's a virus, basically. It's out and it's — basically, when I think of the exponential growth and the fact that it's permeating in so many places, it really is functioning like a virus. So it's infecting people and infecting places because there's reason for that to be there. A lot of that reason I don't think is driven by the government, it's driven by the markets.

I think it's just a new, entertaining medium that we will see evolve. There are probably some entertaining geniuses out there that are figuring that there's a place that the Internet plays between print and between TV, somewhere in between using *Java* or using animation, and a collaborative cooperative type of environment. There's something very cool that is going to be coming out, I believe, because there are all the earmarks of that capability and they're going to need all the sort of constraints that's got them working.

A lot of new activities are, in some way, interactive cartoons. You've talked about people having *Avatar*. It may not be the VRML or some kind of combination thereof, but may be more animation in terms of the three-dimensional type of thing, of more convenient rhythms for the family. But I feel like there's going to be something along those lines, and technology's going to enable it. It's just going to be a new entertainment medium, and I think it's going to be something else, a entertainment medium that may be used in business settings as well.

Also, because it's a virus I think it's also going to mutate how people do things, especially how they do business. And the new, different ways of doing certain things are going to cause things to go away, like the bicycle messenger services — they've been going down for a while. As an industry they may get pushed down. Print catalogues and the cost of printing is just skyrocketing, and there may be some collusion going on because of it. But the Internet is like the Star Trek transporter for business: just go ahead and specify something to be created locally and distributed locally.

In terms of predictions, on a short term I think [what we'll see] are the new entertainment mediums that are going to come up that will enable us to have virtual trade shows. Hopefully, we'll do this kind of thing without physically having to travel someplace and cost so much money. [Meckler] may be depressed about that, but that's another issue.

M: [inaudible]

Michael Bauer: And why go? People are going to live in lots of places where it's comfortable to live, and the medium's going to be sophisticated enough and advanced enough to be able to do a lot of stuff. The only activities might be leisure activities, and now you're meeting people for business in business places.

M: [inaudible]

Michael Bauer: You're going to start paying for marketing, too; that's the one thing.

TUTORIAL

HOW SGML AND HTML REALLY FIT TOGETHER



SPEAKERS

Eric Severson

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Eric Severson: We're going to be talking this morning about the standards that underlie Web technology, and we'll be doing this at a couple of different levels. One of those levels is kind of a high-level overview of what is this thing called HTML. How does it relate to SGML, which is what it is formerly based on? How do you resolve the apparent conflict between HTML and SGML that many of you have heard about or thought about? And then we'll also get down into a little more of a hands-on, detailed level about each of those standards.

But the idea here this morning is going to be, on the one hand, to give you a true tutorial about these standards so you can walk out of here and really know something about how SGML works in some detail, and how HTML fits into that in some detail. Probably even more important than that [will be for you] to get some insights into what goes on in the standards world and, down at the detailed level of these things, how those things actually impact application and business issues.

I'm Eric Severson with Interleaf. I'm also President of SGML Open, which is primarily an association of vendors and some key users of SGML products. It's made up of about 40 to 50 companies dedicated to promoting awareness of SGML, to helping people understand how SGML and HTML fit together and also help them understand the interoperability between SGML products. I'm going to start here with sort of an overview, but probably more than an overview, as a kind of a perspective on these issues so that when we go into the details — which will be done by Diane Sandstrum, also of Interleaf — you'll have a way to look at these things not just as a bunch of dry detail on the standards, but really for what this means to you.

If I were to describe the WorldWide Web in one word, I think I would do it like this: The WorldWide Web is cool. It is totally, outrageously, "way cool." You know, I don't think that I understood just how cool it really was until one night when I was surfing along the Web and ran into the Vatican Web site. I don't know about you, but I personally have never been to the Vatican; but here I was, and they were asking me questions like, "Do I want to go into the north wing and look at illustrated manuscripts from a thousand years ago — done by people who had no inkling of the kind of technology that I was accessing to get to the work that they did — or did I want to go into the south wing where there were other things to look at?"

I think I double-clicked and made my choice for the north wing. As I went through the halls and saw the thumbnail sketches of these things, I realized that I could click on something that I was interested in to get more information. I could zoom in and see it closer if I wanted to, and I could even, if I was willing to wait a few minutes, get a copy of it on my printer. That's way cool.

I don't think that I felt that same feeling of excitement about something like that since, well, maybe when I was about ten years old and someone gave me a short-wave radio for my birthday. You see, I was a kid who grew up on the western shore of Lake Michigan in the state of Wisconsin, in a little town called Manitowoc. It's a town with a lot of factories, a little bit of tourist business, and about 30-35,000 people. I had never heard anything but English spoken there, and even that not always so well. But here I was with my short-wave radio and I was hearing French and German and Spanish and Japanese, languages that I had only read about from

countries that I had only dreamed about. In one moment I went from being a little kid in this small town and feeling isolated to being connected to the world in a way that I had not experienced before.

I just can't help but think, in terms of setting perspective, that for all of these things we're going to talk about this morning, the explosion of interest in the WorldWide Web has something intrinsically to do with the same feeling of freedom and "connectedness" that I felt when I was a little kid with my short-wave radio.

But you know, when I was ten years old my mom didn't come to me and ask me to prove a business case for the time that I was spending with my short-wave radio. Now that I'm about four times that age, people do expect me to have a strong business reason for the interest that I would have in the WorldWide Web, because it's not just about connectedness, it is also a world of business. That's where we have to start from to get a perspective on what we are trying to do with these standards.

Why the heck are people interested in the Web in the first place? This is something that's pretty well accepted at this point: it's a killer infrastructure. It's all there for you. It works, you don't have to build it yourself, and we have the killer browsers like *Mosaic* or now *Netscape* or others that just come into being and are essentially free. The whole thing comes together. But those are only two components to make the whole picture work.

There's a third [reason] that we're still working on, and that's killer content. The content behind the Web, for the most part, has been missing so far. We have storefronts, advertising, interesting Home Pages that are sometimes works of graphic art and sometimes not so artistic; but it's relatively lightweight stuff that we're still cruising around on the Web. Even the Vatican is not really serious academic research material; it's a little closer to a theme park kind of treatment of the material.

We have some places where you can say, "Give me your Visa or MasterCard," and some people are using this internally to do some internal communication of memos and reports and that sort of thing. At one of the last Web conferences that I attended, I was informed that there are now five optometrists on the Web. That's kind of interesting as a way of showing the breadth of the Web, but not so interesting in showing the depth of the Web, because what people are talking about in the business world right now, which is still driving a lot of the interest in this, are more serious uses that include internal and external corporate publishing — which might include books and magazines available on the Web — and really more serious material for business research, academic research and so forth. They're even looking at the Web as the main way in which we would distribute information internally within corporations and government organizations.

If you don't take that point too seriously, I would ask you to consider what Bill Joy of Sun Microsystems said, quoted in *Information Week* this summer. He said, "With the hyperlink kind of paradigm that you see on the Web, you can imagine putting all of your corporate documentation on there, even design files for machines." Well, that's pretty amazing. I look at that and I say, you know, in the '60s people started trying to figure out how to organize business information on computers, and that started getting on a roll in the '70s. The MIS departments — or IS and IT, as they'd be called now — started really perfecting this idea of how you integrate all of this information within a corporation, and the '80s was the age of desktop publishing and integrated electronic publishing. We're getting into document management and all of this as we move into the '90s.

But suddenly, in one stroke, the Web has obviated the need for all of this, because with the hyperlink kind of paradigm that you see on the Web you can imagine putting all of your corporate documentation on there, even design files for machines. What does that mean? What

does that actually mean to say that this is what we're trying to do with the Web? That's part of the perspective that I want to get into here.

Now, again, what's the attraction? We try to answer this question, what's the attraction to the Web, in a little bit more detail. Well, it lets you do on-line distribution of simple information, and it does it with a pretty nice format — not the best that's ever been seen, but not bad. You can hyperlink, as Bill Joy said, and that's a very powerful way to get around information.

Most importantly, it's open access. As an IT director, for example, I don't have to go in and say, "How do I introduce this strange new technology among all of my users so that I can get them talking together?" They already know about the Web — you'd have to be dead not to know about the Web — and so this becomes a very, very open standard in a way that goes far beyond most efforts that you think of as standards efforts.

But where is it going? If we're really to do what Bill Joy has outlined in his vision, we're going to have to address the same issues that have been addressed in other attempts at integrating corporate and governmental kind of information. You've got to have some central source that drives a whole bunch of different things. The only output that you're going to be thinking of — well, the Web's not going to be the only output that you're thinking of. You're going to have paper production, you're going to have CD-ROMs, you're going to have interchange with other kinds of systems, and as you look at this crazy world that we live in, where every trade show like this that you go to you find that all the technology keeps changing and the vendors acquire each other and merge with each other, what are you going to do if you're going to build a long-term system?

So people are looking at standards like SGML as a way of saying, "Maybe I can protect my data over a long period of time where this doesn't depend on the vendor or the application that I happen to be using today." And, "I don't know all the ways my data is going to be used; today I have these four things I can tell you, one of which is the Web, but I may have ten other things next year — I don't know, so I need to have a format to store this stuff in that is capable of reuse." And it isn't just publishing; it's also linkages to other business systems. When you start to get into these things you start to be able to consider the question that Bill Joy raised. So I observed this, again, as a matter of perspective, that there's obviously no end of wild enthusiasm for all of the Web things that are going on.

There's certainly a very strong desire for simplicity in what we're doing. We want these standards to be simple. But in reality there's also a wide range of things that people are trying to do with the Web, and there's a big trade-off between these last two points. The desire for simplicity and the wide range of needs is leading up to people asking questions about this. When I go to conferences I see people stand up after keynote presentations and say, "Yeah, but what's the difference between SGML and HTML? And maybe more to the point, if you have HTML, do I still need to even think about SGML? Can I maybe forget about that now that I have HTML instead?" Well, we've got to look closer at SGML to figure out the answers to those questions.

As a real brief kind of overview, SGML is an international standard. It was brought on-line as an ISO standard in 1986. Its focus is on encoding the intrinsic nature of the data rather than encoding a particular kind of scheme that makes a vendor system run; that is, it's not like, let's say, a *WordPerfect* file full of command codes that lets *WordPerfect* present things on the screen or on paper as bold or centered. Instead, what it is is something that says, "This is a title." And then we can decide what command codes and whose system to apply to make that title look right for somebody. But the point is, this data is a title. And it's in that sense that SGML is a format that can get you a long-lived representation of your data. A typical SGML file has things in it like titles and headings, and lists and paragraphs and table rows and columns, and that kind of logical view of what's in the data.

I don't have a crystal ball or a time machine and I can't look ahead 50 years to see if that data would still be usable 50 years hence. Who knows what's going to happen even next year? But I can run a little thinking experiment that can help me decide whether that data is long-lived by going back in time 50 years and asking myself if 50 years ago, before any of this technology that you and I work with every day was even conceived of, if I had a file format that told me that something was a title, a heading, a list and so forth, would that have made sense to people then? Yeah. Would it make sense to people now? Yeah, because that part hasn't changed. It's all the technology surrounding it that's changed, and so I have some faith that 50 years from now something encoded in that simple kind of generic way would have some long life. That, more than anything else, is the idea behind SGML.

Another side effect of that is that if you've encoded things that way it's platform-independent, and it's open interchange between systems, between vendors and so forth. So, for all those reasons, it's not too surprising that SGML actually was the standard chosen as the basis for HTML. If we explore this sort of technical jungle of SGML a little bit further, look at it one level down, it doesn't take a very difficult document to understand what's going on.

Here's Disney's [Web site for] *The Lion King*. It says, "If you like Africa, you'll love Disney's new animated feature, *The Lion King*. *The Lion King* uses a new animation process..." and so forth. How would we have encoded that before SGML? Well, it would look something like this, probably uglier than this, but conceptually we would tend to say that we need to issue typesetting instructions or screen presentation instructions that somehow are embedded with the information and the file. We want to center and then embolden and underline this thing called *The Lion King*. Notice that nothing in that says why we would want to center and embolden and underline; we do that because we know that the reader is going to look at something that is centered, bold and underlined as a title. We've been trained to think of it that way, but the computer file knows nothing about that, it just knows how to present it so that you can process that information in your head.

Let me space down, and we indent and we say "italicize the word Africa." Why? Well, we're trying to cue the reader that there is something special about the word "Africa." What's special about it? Well, in this case, it turns out that it's in the glossary and you can actually look up more information about Africa if you'd like to. That's not as clear to the reader as the title part is, but you know that there's something about "Africa" if it's italicized. And then we go back to plain text, and "You'll love Disney's new..." and so forth.

That is the way that electronic publishing and word processing has essentially worked from the beginning. With SGML we take a radical new view, and it looks like this: we say sure, it's centered, bold and underlined, that's all fine, that's just the way you're telling the person how to read it. But the real point is that this is a title; and more than that, it is a title that is part of a larger object called the "chapter." The chapter starts here and it goes further down, but this little piece at the beginning is the chapter title. And it turns out that the word "Africa," while it may be italicized in the way we print it out, is important because it's a link to something else. So let's just say so, say that it's a link. I can choose to italicize it or do anything else I want with it, and 50 years from now this will still be a pretty meaningful representation of what that file was about, no matter what the technology was that was used to process it.

If we separate things that way, we then have another fundamental principal of SGML in play here — also the principal behind simpler stylesheets and so forth in word processors — which is to separate format from content. If I have my SGML telling me what the content is, I can then go and have many different representations of that data, maybe have two different looks on a printed page, maybe put the title in a button that I can double-click on if I want to expand for more information. All kinds of things are possible when I've done this kind of separation.

Furthermore, the more information that we get on the Web or inside of a corporation or anywhere, the more important it becomes to search things. If you're searching through a book and thumbing through things, you use a little more of your brain power than to start from the very beginning and just start reading every word until you find what you want; you start looking at chapters, and you look at the context and you kind of zero in as fast as you can to the most likely places in the book that you're going to find the information. If you're starting to do an electronics search and you're saying, "Well, I guess I'd want to search for anything that has a center and a bold code around it," that's a pretty rough-cut kind of electronic search. But if you can say, "I'm looking for this information only if it occurs within a title or within a chapter," now you're starting to home in electronically the same way you would if you're doing it manually. SGML also provides that kind of capability through this generic tagging.

And finally, once you've found something and you're able to present it in any way which you care to, because it's all been separated out logically for you, it becomes real possible to reuse the information. Here we have today's movies from this summer: *The Lion King* at 1:00 p.m. — and gosh, you know, I swear somebody wrote something really cool about *The Lion King* already. I don't want to have to make this up again; let me search through my database and pull out this little chunk that describes *The Lion King* and stick in my listing of today's movies. That's data reuse, and perhaps data reuse that could have been anticipated when we set up the original description of *The Lion King* — or maybe this was something that happened spontaneously.

But with these kinds of concepts behind the data it's not so hard to go pull that out. The reason for this is because, intrinsically, SGML is about objects. It takes a document which would otherwise be a stream of text characters, with some line breaks and maybe some proprietary formatting codes embedded within them, and it looks at them as a set of objects, objects which can be contained within each other. It chunks the information into objects that are generic, and it goes further than this — it puts them into a structure. This gives you another level of control over the information, as well as another level of browsing and search that is possible with the information. Unlike a stylesheet, this isn't just a chapter title followed by a paragraph followed by something else in the big linear stream of objects; this is actually a structure. The title lives within a paragraph, so if I find something in the title, when I do a search I can pull out the whole chapter because I know where it begins and ends. That's all marked up within the file for me because of this object notion of SGML. And this particular link lives within a paragraph.

Furthermore, I can see that the data has a problem if there's no title in it, because the title is required. Or I can say that you can't have two titles, you have to pick one. There are automated means to check the structure against those rules.

In SGML each of these structures is called a "Document-Type Definition," or a DTD. Diane is going to show what these things really look like, hands-on, a little bit later this morning; right now you can think of it essentially as a list of the kinds of objects that we want to capture in a document. I think that it's important to capture the notion of a title, so I've named something "Title." But also, it captures the rules by which these objects relate to each other; the title lives within a chapter and a paragraph and a link and so forth.

Each one of these applications of SGML or DTDs defines a specific use of SGML, which might be the way that SGML is standardized within a particular industry. The CALS effort, for example, is the United States Department of Defense use of SGML, and there are actually a set of applications that are all kind of related to each other that are defined there. [ATA ten0] is for the aerospace industry and defines the way, for example, that vendors like Boeing pass data on the 777 plane to United Airlines and so forth. It's an interchange standard that's a specific use of SGML with its own set of objects, its own structure. DocBook is something that's for on-line display of computer documentation.

I can make up any DTD, according to my own needs at my own organization, to describe my documents. It so happens that one of those DTDs or SGML application is HTML. HTML is a pretty simple one; it says that there's a heading section of a document followed by a body, and pretty much — although it's getting more complicated over time — pretty much what we're trying to do is capture paragraphs and links or URLs and so forth between documents. We also have some headings that are in there that can be displayed in a larger font, etc.

Nowadays, with HTML 3.0 — as Diane will show you — we're adding forms and tables and figures and a few other more complex typesetting objects, but pretty much HTML is this sort of a structure, and it is specified formally in an SGML document-type definition. So the technical answer to [the question], "do I still need SGML if I'm using HTML?" is that you already have SGML if you're using HTML. HTML, just like CALS, ATA, DocBook, etc., is an SGML application. It's a specific use of SGML.

So where does HTML fit in the jungle's food chain? Well, I like to look at this as kind of a level of accessibility and reusability question. Paper, of course, is the least accessible in an automated kind of fashion, and the least reusable. You can run it through a copy machine, you can go to a warehouse and have somebody find where you stored paper and that sort of thing; but in itself it's not a very good storage medium and that's why we're going electronic.

Adobe's PDF, which underlies *Acrobat*, is an electronic format that's not too much more sophisticated than paper. It's not revisable; it does a little bit of cross-linking and so forth, but pretty much you're seeing paper on a screen. As you move up through the revisable formats and get more and more explicit structure in linking, you begin to increase your ability to access and reuse data. And finally, SGML, which is the most powerful — but also the most complicated — of these things, kind of sits there as the ultimate in flexibility, accessibility and reusability. HTML, as it goes from HTML 2 to HTML 3 in the standards world, is kind of trying to figure out where to fit there. We'll show you more about what that means in detail.

These kinds of perspectives on it, though, add or lead people to ask the question, "Is HTML a general interchange format? Is that the one I could use to interchange data all over the place? It sure kind of seems like it, because we're talking WorldWide Web and interchange, right? And could it be the form in which I store my documents? Wouldn't that be good, because I'm going to use the Web for all kinds of things? Why don't I build an HTML repository so I can have access to all my HTML documents?" It sounds logical, but these are very, very important questions. How do you put these concepts together?

Right now, SGML is kind of in its own world. Mostly it's with high-end applications like the Department of Defense technical documentation and the Boeing 777 and so forth; it's not in very widespread use, although it's used in almost every major industry that you can think of in high-end applications. And HTML, of course, is all over the place. But these kind of live in their own worlds, and for the most part the people who are authoring data for SGML or other high-end publishing systems are not the same authors of the HTML data — or if they are, they're using a different system. And you see people winning product awards in the industry and so forth for finally giving something that will allow them to do HTML-authoring. So these are different worlds, but we need to put them together.

Here's one way, but I don't like this way. This is where HTML is in the center, and we author for HTML, and if we want to do something else with the data we figure out some way to bridge that to other systems, including SGML. Why not put HTML in the center? A lot of people are doing it. Why not?

Well, I'll tell you why not; because HTML is the lowest common denominator, a one-size-fits-all format, and if you talk to the developers, the editors of the standards like Dave Raggett and Don Connolly, for example, they will tell you that's what it's meant to be. That's the

whole point — it's supposed to be really simple. You should be able to type it out in a VI editor if you want to. Now, the question for you is, is that what you would want as the standard to store your data so that you're prepared for everything you might want to do with it? Your purpose for it is different than what Dave Regget and Don Connelly are saying.

Secondly, as they say in the HTML standards world, it's whoever shows up with working code that wins the day — and the standards can change overnight because somebody stays up at night and decides to make a change, and then broadcasts it the next day. If you happen to be on e-mail you'll see it, and if you're out of town, oh well, you'll catch it next time. That kind of volatility in the standard is a reflection of the explosion of this technology, and the fact that nobody wants to wait for some kind of formal standards process. I can understand that, and you can understand that; but is this the format that you want to base your information system on, when it's changing that fast? That's my question.

And third, if you do choose to base your information system on that you will have a fantastically difficult “up-translation” problem in the future. Now, what does up-translation mean? Think of it like Shakespeare: “To be or not to be, that is the question. Whether to suffer the slings and arrows of outrageous fortune...” Well, you see, there's a simpler way to express the world's library of Shakespeare. I could distill Shakespeare down into something that a first grader could understand, and would be much more efficient on a disk. It would be much more efficient to pass around a network by reducing Hamlet's soliloquy to the simple statement, “Is this jive worth it?” It's the same thing, really. If I ever wanted to put on a play with the real Shakespeare in there again, and I had reduced my storage and my library of Shakespeare to this form, how on earth could I ever recover the original from that?

That's the point. That's the point as to why HTML is not a sufficiently rich format in which to store all of your corporate information, despite Bill Joy's comment. You have a richness to your source information, and a richness to the application requirements that you are developing for, or that you as a manager are trying to manage. It goes far beyond the capabilities of HTML, and if you put HTML in between that and all of your formatting, search and reuse requirements, and get rid of the rich source because now you've gotten HTML, then you're forever limited by the capability of HTML.

The perspective that we're going to show you here is for HTML as a publishing medium. It's a ways to go from an SGML-based system or any other form of rich-source information and get that information out onto the Web; it is not in itself a repository format or an authoring format. But be careful, because what's happening all over the place, as we speak, is that people are authoring documents in HTML; and if you allow that to happen you are in effect building an HTML repository, and later on the only answer is going to be to say, “I'm going to have to put all this HTML stuff under control. I've got the ‘is this jive worth it’ version now, and I can't afford to sit and try to re-translate it back into Shakespeare.” And this applies at any scale. I'm talking about SGML and HTML here, but in between SGML and HTML might sit word processors or electronic publishing systems. Whatever the appropriate forum is for your source data, you should manage your own source data and look at HTML as the way that you'd get onto the Web, not the other way around.

SGML and HTML were meant for different things. We'll see this come out in the details that, as we look at this desire for simplicity versus wide range of needs, it's HTML that addressed the simplicity side of this. It's very simple. It's forgiving. It's basically meant to give you some presentation and some linking. That's what it's for and, like I said before, it's one-size-fits-all.

SGML addresses the wide range of requirements. It's extremely flexible and powerful. Its intent is to enable access and reuse, and it's application-specific. But, of course, in being application-specific, it gets complicated as well. We have to ask, what's wrong with simplicity?

Why not keep it simple? And one way to look at it is that in SGML, if you have a document — let's say this is something like a technical report — and it has Abstracts and Intros and Prefaces and Notes in it, in SGML I can make up objects that describe all of those things, and I put that into my DTD and I say, "Here's my application."

With HTML, which is bound to a particular set of objects when you get it out of the box, you have to decide, well, let's see, "Abstract." Is it a Heading? Is it a Link? Is it a Table? Well, the kind of the thing that's left is a Paragraph, so I guess an Abstract would have to be coded as a Paragraph in HTML. And actually, that's true for Intro and Preface and Note and Summary as well — they're all Paragraphs to *Mosaic*, if you will, so you've lost that distinction. And in losing that distinction you lose the ability to come up with a different format for presentation for each of those objects. That was very important to you when you were producing paper, but now it all kind of runs down the screen looking like a typical HTML document, because they're all Paragraphs and they all have the same style for that reason.

The same is true for search and reuse. I say I want to find *The Lion King* only if it's in the abstract. On HTML I have to say, "Well, all my effort is in a Paragraph and that means it could be many places. I can't localize it to the Abstract." That search point, which is often lost as people are looking for things like centering codes in HTML 3.0 and are really focused in on the format, is something that I think is going to be a more and more important part at looking at the Web, because the Web is the biggest thing that's happened to us since sliced bread. It is also the biggest example of an information explosion, or of the information explosion that we have in front of us.

I kind of look at it this way; in computer science we've been working efficient search techniques for a long time. First we had this sort of linear search, and that proved to be very inefficient — starting at the beginning and just going until you find something just doesn't work very well — so then people fairly quickly invented binary search. Now we're kind of going around like a pinball machine until we can find the thing in a little more efficient way, and people have been developing from there on and on and on. People get Ph.D. dissertations in more effective search rhythms.

With the Web we have brought ourselves to a new peak, or perhaps a regression, in the search technique that we use there, which I like to think of as "house fly" search. What do I mean by that? Well, have you ever noticed that when a fly buzzes around a room, it doesn't seem to have a very strong plan as to where it's going? It kind of goes zzzzzz...boom. And eventually, with that kind of search rhythm it will find what it wants. Browsing around on the Web, unless you're using a pretty highly-targeted index or have something else supplementing it, is a lot like the house fly searching for things; it's sort of fun if you like all of the scenery as you go by, but if you're really trying to get the right information to the right person at the right time, it's not a very efficient way to do that. Well, then why not use just SGML? [You might say], "You've convinced me, Eric. The heck with HTML, let's go with SGML."

Well, there are reasons not to do that, either. It's not quite that simple. There is, like it or not, a lot of up-front investment necessary to build SGML applications. The reason that it has been used on these very high-end systems, for the most part, is because they can justify that kind of cost up front because of what you need as the result. It takes a long time and it's fraught with difficulty with today's state of the art. And while I don't think that's so much a point against SGML intrinsically, it is a practical thing to remember that the state of the art right now doesn't really support just casual use of HTML with very little up-front investment.

Furthermore — and this is a little more subtle technical point which you'll see played out as you look at these actual DTDs and so forth with Diane — there is no standard backbone structure in SGML. There's nothing that pulls it all together so that everybody's talking the same language, because every application and every DTD is its own set of tags, objects, and

elements that somebody makes up for their own purposes. My application might call something a Chapter and an X-ref, and you probably can decode X-ref and say, "Is that like a cross-reference?" Another application is pretty obscure and cryptic: H1 and A. That's actually HTML. Maybe the H1 is fairly obvious because people are sort of used to hearing of typesetting macros named H1 and H2, but the A, what's that? It's for "Anchor Point," and it means a link. "Oh, anchor, I can see that." But it has to be explained to you. But HTML doesn't stop there; I could have tags that are called Joe and Schmo. They're just objects, and I get to name them. I get to tell you how they relate. There's no sharing of semantics between these applications that pull it all together into something like a WorldWide Web.

The semantics are in your head, and you're the one who has to know what they are. It turns out that I can explain to you that all the things in the top row are headings and all the things in the bottom row are links, and now you've got the decoder ring and you can figure out the applications. But with HTML, because you're bound to just the things in the middle, there's no problem like that. Every browser, every application can count on things being called the same.

SGML is powerful and flexible, but too general to really be the backbone as such. So how do we resolve this dilemma? How do you relate these two technologies to be both simple and powerful? Well, my assertion, and we're going to show you how this works out in detail in a moment, is to make it scaleable. There are a number of ways to look at this and a number of ways to implement it. The dust has not settled on this question yet, but one way or another we've got to look at this thing and make it scaleable.

The Web is about access for everyone, but the Web is going to have to handle much more complex material if it's really going to take off, at least in more serious applications than it can right now with HTML. Yet we don't want to make HTML any more difficult. So how do we do this? The answer has to be scalability, scaleable from simple applications to difficult applications, somehow all at the same time. And I would like to propose that the acid test for looking at the Web in terms of scalability is something like this: that you still need to be able to say something like "Hello, world" with typing a few tags in VI just like you can right now. Otherwise you've taken this nice, simple, generic thing and turned it into a monstrosity.

I want to be able to look at a corporate annual report or some other combination of highly graphical data, and yet do other data at the same time, and I want to do that on the Web. Maybe not in two to three tags, but I need to be able to do that also, otherwise this is doomed to be an interesting thing for home use and casual browsing but really not a business application. More than anything else I would like to be able to do, in theory, something reasonable with this data, even with the simplest HTML browser. In other words, no matter how complicated this corporate annual report is I'd like to be able to view it with *Mosaic* as it exists today, or something that's of that level of complexity. That, to me, is scalability.

Now, this is the kind of scalability we see all around us. We could just go home and watch TV because, as it turns out, I can go and pull a black-and-white TV set out of the attic of my grandfather's house — maybe it was built in 1960 or something or like, say, 35 years ago — and I can plug it in and I can watch today's stereo, surround-sound broadcast on that black-and-white TV. I don't get nearly the effect that somebody else does, but I can do it. I have access to it even with my very simple receiver. These days, of course, that's not how most people watch TV. If they have a big enough checkbook, they can go to the electronics store and they can add color, of course, and stereo these days, surround-sound, even things like secondary audio programs and close-captioning, all on the same signal.

But you don't have to do that. In order to receive today's TV programs, you do not have to go buy one of those sets; you can, in fact, strip all of that away and still watch it in black and white. You see, we could have said, "Now that the technology allows it, everyone must

have a home theater system.” But we didn’t do that. We didn’t restrict it that way. We also could have said, “Well, nobody gets anything but simple black-and-white because we want to keep it really generic.” But we didn’t do that, either. We allowed for black-and-white TVs and for TVs that can do all kinds of magical things, all out of the same signal. And that’s scalability.

Although that’s not a perfect metaphor for the Web, that needs to inform how we look at these standards and how we put together the systems using them. It is possible to look at HTML and scale that in somewhat the same way by looking at these objects like H1 and Paragraph and so forth as actually being classes of objects for which the user might have more specific distinctions — like Abstract and Note and Paragraph, all of which turn out to be related to the higher-level class of Paragraph.

In the current proposal for HTML 3.0 there is an attribute in there, as Diane will show you, called Class, which is meant to be able to capture some of that side-band signal with the surround-sound in it, if you will. But for a simple browser, you can collapse it all back down and say, “I don’t understand about Abstracts and Notes and Summaries and what to do with them, but I do understand Paragraphs just like I could today.” That’s just a basic construct in HTML, but now I’m looking at it as a class of object. That allows you to take an HTML browser, which looks at a document like this, and have it actually look at rich source data with all of those distinctions explicit. By overlaying through this concept of “my user-defined objects actually fit into these classes of HTML objects,” I’m able to look at it simultaneously as black and white, if you will — or, if I have the right receiver, as stereo surround-sound and color. And this works with any kind of SGML document.

I could have another one, like this as a magazine article with Abstracts and Headlines and Bylines and Sidebars and that sort of thing. I’m limited to the same set of classes from an HTML standpoint, but if I overlay that on this, I again have this ability to look at it in black and white or in color and stereo.

There are a number of different ways that this kind of technique might be implemented, but the key point to begin with here, to inform what we’ll talk about in a moment when you look at the actual tags and attributes that are underlying this, is that if you don’t think of this as a scalability problem as developers, you end up creating two separate worlds. However this is implemented inside the standards when the dust settles, if you think of it as a scalability problem then you are informing the way that you’re putting together these systems, so that in effect you can achieve this access for everybody with a backbone structure and yet not giving up the richness of the source data.

So HTML and SGML need to coexist on the Web along with some other formats but, as I’m saying, with smooth scalability so that there’s a way to start out using simple things in HTML but also be able to express more complex data using the same basic architecture rather than creating a quantum leap where you’re either in the HTML world or you’ve made the jump into the SGML world. HTML is about open access for everybody; SGML is about application-specific access, and it doesn’t have the backbone structure unless you put something like HTML as a wrapper around the whole thing, at least conceptually, to allow everyone to understand each other’s data at least at the level of, let’s say, a black-and-white TV signal.

So, for this overview and perspective part of the tutorial, I would summarize it this way: HTML is an SGML application. It’s not in competition with SGML, technically because it already is SGML, but it’s a specific binding of SGML for a very specific purpose. It is not meant to be something that is the be-all and end-all of everyone’s need for data storage. By looking at it as a backbone, it is possible to both take advantage of SGML’s power that underlies HTML and use the simplicity of HTML as an organizing principal for how we’re distributing information, without having to throw away the source data that underlies this if you look at HTML as the delivery mechanism to get to the Web, not as the core of your system.

So, for this part of it, thank you very much. What we're going to do now is take a stretching sort of break here, and when we come back we're going to start with Diane. We're going to go down into the hands-on level and really get to the sort of nitty-gritty part of the tutorial here. So, we'll see you in five minutes.

[Tape change]

Diane Sandstrum: Okay, I think we'll go ahead and get started again. Can everybody hear me okay? I would like to introduce myself. My name is Diane Sandstrum, and I am a regional Training Manager for Interleaf. I oversee a lot of the SGML course development relating to SGML and our products, the related technologies that we have to deal with these conversions and what-not.

What I would like to do is I would like to expand upon some of the things that Eric has brought up and proposed and take everything sort of another level deeper to take a look at some of the technical aspects that underlie some of these ideas that he has presented.

What we'll do first is go over some HTML basics, some of the raw technical stuff that can get really dry at times. We'll try to cover that pretty quickly, but I think it's very important to go through those so that you can have a deeper understanding of some of these issues that Eric has brought to the table. Once we go through those SGML basics, then we'll be able to take a look at how HTML really does fit into SGML. We'll take a look at some of the features and functions that HTML is or isn't, and then we'll discuss a little more how HTML could evolve even further with SGML.

Some goals that I have: I would like for you to leave here today with a pretty good understanding of SGML so that you could pick up a DTD and casually read through it. We're not going to go through all the details of the DTD; I don't think anyone is really that interested in going into that kind of detail today. But hopefully you'll be able to get a good general idea of what's going on in these DTDs.

I would also like to link back to some of Eric's concepts that he brought up with some more technical examples, so let's flip back for a second to some of the things that Eric said.

He pointed out that SGML is really about objects that we can define. We decide what objects are important to us to take care of in our documents, but it's more than that. It's really SGML that homes in on the structure of those objects that we're managing, and that's done through the DTD. The DTD is a specific application of SGML, including HTML.

I think what we should do now is look closer at what these objects are, what the structure means, how we define the structure between the objects, and what these DTDs are. What are these all really about? What goes into a DTD? It is your Document Type Definition; you are basically defining a type of document that you may have out there. You pick out the specific elements that are important to you to control and, more importantly, you are defining the relationships between those different elements.

What is the structure that's defined within that document that you have within your document? You have chapters, and within those chapters you have sections. Within those sections you get into more the detail of your document.

What about formatting? Where does that fit in? Well, Eric had pointed out that we're really getting away from that, and we want to be able to not concentrate on what something looks like or how it's presented. But really, on what part of the document is this and how does it relate to everything else around it? Formatting really is not a part of the DTD. We're just focusing in on the elements and their structure.

What does the DTD look like? How many of you have seen a DTD before? Okay, a good number of you. This is a very simple, small snippet of a DTD. We'll kind of focus on some

of the details here, some of the syntax so that you can understand or have a better appreciation for what's really going on in this simple text document. Here is a sample of some HTML mark-up. Eric showed us some small snippets before.

Basically, all we have is a document with some mark-up in it. And by mark-up I really just mean additional information that we're putting into the document to enrich that data. This happened to be some tags stating what types of elements we have within the document, and we'll take a closer look at this also. I would like to point out, though, that each HTML mark-up, as I'm sure most of you have seen, absolutely looks at the [inaudible] documents. It is the same; it's HTML mark-up, but it just has a specific set of tags that it is using.

Let's delve deeper now into the jungle, or under the hood of it, to look at these different components of the DTDs, focusing in on the main things that you will find: your "elements," your "attributes," and your "entities." So back to that sample DTD that we looked at; we'll look at these element declarations or attribute declarations and entities, how and why they're used, and how to get the most use out of them and so on.

Let's start with elements. Again, we're just identifying specific pieces of information in our document. Now, each element that you have and you define in your document contains many different things. It could contain other elements like a chapter, it could contain a section and so on, it could contain actual data or it could contain a combination of the two. So take a look at that.

Here's a sample piece of mark-up. I just want to point out, in reading the actual tag SGML files, that what we have here to identify each element is a set of tags, both the begin tag and an end tag. It's simply the name of the element with angle brackets surrounding it to denote where that begins and ends. The end tag is just like the begin tag, but it does have the forward slash at the beginning of that tag to denote this is the end of this element. And I've just highlighted in this mark-up all the tags for this simple example.

More importantly, what's going on here is that we can actually see a structure unfold here. If we walk through this, we can see within our Chapter element — our Chapter contains what? A Title and a Paragraph. It begins and ends here and then our Chapter ends here at the bottom. Our Title element has what? Data. But then if we look at our Paragraph element, we have Data and nested within that we have another element. Those are those three different options that you have, or ways to define an element and the types of information that it can contain.

How you actually define an element in your DTD is pretty simple. We're going to name it and then say what types of things it can contain. Now, this is actual syntax you see in the DTD. For each thing that you define, you'll see the set of angle brackets as a line item in your DTD. So we see here that we have the angle brackets surrounding our entire definition. You'll see an exclamation point, which is just saying I'm going to define something, and then what it is you're going to define. In this case it's going to be an element, and we're going to name that element, and then following that we have our content model.

I want to talk about this content model. Again, we have three options of what an element could contain. It could contain other elements. Our elemented Chapter contained what? A Title and Paragraph. Our element of Title had just Data and that's listed here. It's denoted with a pound sign, PC Data. It's just a specific type of data that's available to you, and has special meaning in SGML; but if you see anything in your DTD that says "data" in it, it's raw data [such as] S-Data, End Data, C-Data, PC Data. We don't need to get into the detail of how those distinguish from each other, but just so you know if you come across it, you'll have an idea of what it is.

Here we have an example of how an element can contain multiple combinations of things. In this case our Paragraph element contained Data and an [inaudible] element for

emphasis and so on. Here's our small DTD for our small mark-up example that we had, and I'd like to just pull up that mark-up with it and just walk through and show you the different pieces, and exactly what we're defining. I'll highlight as I go through what's being defined and where that sits in the mark-up.

First we have our Chapter element that contains this entire block here. The chapter contains a Title and also a Paragraph. Our Title has just the Data, PC Data, raw data here. The Paragraph begins and ends here, and has Data as well as that nested element; and then we go down to the [inaudible] and that contains just Data. [So that's a] simple walk-through of our DTD and our mark-up.

What I'd like to do is point out a couple of things. How we are actually defining structure and order? Those are very simple examples, but you can get into much more complex structures, and there are some different notations that are used to help you do that. I would like to go over these in detail, and how they're used and how they can help you define the relationships between objects — sort of the when and the where of the things that will occur in your documents, whether some things are required, how many times an object can occur, and what the order is that these things should occur in.

There are two different types of notations that you can use: those that help you define the order of elements and those that help you define the occurrence of elements. We'll start with the order. We have these three different "markers," I guess you could say, that help you define these relationships: your comma, the [inaudible] bar and the ampersand. When using a comma within a content model, you're saying that these items, as I list them, must occur in this order. Here we have an element called Letter that has an opening followed by a bobby followed by a closing. Those are all required and they must be in that order. You can't have your closing first, per se. Then we have the [inaudible] bar. This lets you create a set of conditions where you're basically going to pick one of these options.

For my List element, my List element is going to contain either bulleted items or numbered items, one or the other but not both. And then the last for ordering is the ampersand, and this says that all the elements within this list or set must occur, but they can go in any order. A good example of that is a Memo; a Memo contains these items: it has a "to," a "from" and a "date." All those items must be there but I don't care the order that they come in, so the ampersand is used to separate those. Then those three items, in whatever order they come in, are then followed by a [inaudible]. Okay? Yes.

M: One question: [inaudible].

Diane Sandstrum: Yes, and that's actually — you caught me. That's a mistake. I have an unmatched parenthesis; sorry about that. Good catch.

Going on to some other notations that you can use... These help you define whether or not something's required or not, or how often something can occur. We have three indicators here: a question mark, an asterisk and a plus sign. How the question mark works is very simple; this, when following an element or set of objects, means that that is optional. It doesn't have to be there but it can. So you'll see that in your document either zero [times] or one time.

The asterisk is similar to the question mark in that the element that precedes it will be optional, but it also allows it to repeat. So you'll see something with an asterisk on it zero or more times. It doesn't have to be there, and if it is I can have as many as I want.

And then, similar to [the asterisk] in that it's repeatable, is the plus sign. It allows this item to repeat, but it's also required. You must have it at least one time, but you may have it as many times as you need.

Let's just look at these examples here. We have an element called Manual, and it has a Title — followed by what? One or more Chapters, and then an Index, or maybe not [an index], it doesn't matter. Then we go into this Para One element, [with "Para" being short for Paragraph]. This has an Optional Title followed by a Para, and then down here we have a set of items that have a question mark on it — so this whole set within the parentheses is optional. But if we do have that item there, what is it? It is a Subpara — followed by what? One or more Subparas, meaning we must have two or more. So there are no indicators that say this has to occur three times, but you can explicitly define it.

A [inaudible] is one followed by another followed by one or more. And then we have down here — we're going to have a dinner order here, and our first item is an appetizer and that's optional but repeatable, so you can have as many appetizers as you want. That's the one that my husband likes the best. You may pass on the soup, but you're definitely going to have an entree and then one or more desserts. That's the one that I like; you must have dessert, that's the best part. You cannot pass up on dessert.

W: But you can pass up on appetizers.

Diane Sandstrum: Yes. And soup. But multiple appetizers, you can order them all.

I think the most important things that you want to look at when you first are looking at a DTD are: understanding how to read these content models, [understanding] what all these little symbols mean in between, and what it means for the structure of my documents. And these help you to, again, say how many times something occurs, whether or not it's required and where it sits in the order of the whole scheme of the documents.

In defining instrumental elements, you can — or I guess if you look at it, it's how can I use my SGML elements to their full potential? What can I get out of them? Well, you can create a whole wide variety of elements. If you're setting up your own DTD in your own SGML application you get to define what it is that you need, and that variety of elements that you can lay out can be very beneficial to you in that you can create very robust documents either for use now or for reuse later.

By having a wide variety of elements, it can also help you with search and retrieval. We'll take a look at that, and Eric could mention that also. And with this structure here you're defining the structure, and that structure will be validated, and that can be a very important part of the process. Eric talked about this idea of how SGML allows you to have many different objects — versus HTML where you're limited at the Paragraph level to really just one object — and how that can help you because you can apply these different styles to distinguish those different elements, and also to help you in your search and reuse. So I'd like to expand on that a little bit more.

Let's say we have sort of a one-element structure. We have an element of Body that contains — what? One or more Paragraphs, and that Para has our Data in it. If we look at the structure like that versus something where we have a more robust element structure, where we have our Body that contains a Para, Note, Warning, Abstract [inaudible] — and you could go on and on — and all of those different unique elements contain Data. We have a much richer base that we're working from.

If we were to just display a document to see what that document would look like — I've set this up. It's not important for you to look at the content; it's a little blurry for you. But what is important is for you to just [look at] what catches your eye, which formats are catching your eye. The actual content of both these documents is the same, but the Abstracts, the Introduction, the Note, the Warning and the Summary have all been formatted differently. But if you're going with an HTML type of distribution, you're really limited to one Paragraph.

And now to research and retrieval... Here we have Mr. Supervisor up in the corner telling Joe Worker here to go and gather all of the Abstracts. He's completely baffled because he's looking at his HTML, his whole suite of HTML documents, and all he has are Paragraphs. He doesn't know what to do. We have this other worker over here who's very happy and very excited because it's very easy for him to go and extract that information, because it's been explicitly encoded in the file. So that's how having the variety of elements can help you.

Let's look a little bit more at the document structure and what that's all about. In the content models you can define these explicit structures within your document and create these different hierarchies. You may ask why that's important.

The thing about using your SGML documents is that when you go to process the SGML, the first step in processing the document is the document will be verified or [inaudible]. And what happens in that stage is that your document, with all of its tags and mark-up, is checked against the rules that have been defined in the DTD to make sure that everything is in place that should be there, that nothing is out of order and so on. That can be very important, whether it be for a standard or for your own use of information. It may be absolutely crucial that that be there, and without having to do a manual check to see that that's there, you can have a much more automated process for that verification. Also, it just helps to maintain the document integrity for now and for reuse later.

This might be a little extreme, but the whole point here... Here's another supervisor. He's very angry at his employee because somehow, when these documents went to print, those Warning Paragraphs got left out. Now this guy's job is on the line, and he's sweating a bit. Again, it's probably not a realistic example, but the whole point is that the SGML can help you to verify the structure of your documents and verify what's required and what needs to be there.

By using a robust set of SGML elements you can have a more focused search and retrieval and you can get into more component-level management in maintaining the information, more of a granular level. Rather than an entire document or entire chapter, you might want to focus in on specific sections and so on. You can validate the structure, you have more flexible reuse and your documents are much more rich and robust.

So that's about all I'll say right now about SGML elements. Once we get through some of these SGML basics, we'll refer everything back to looking at HTML and what it all really means.

Do most of you know about attributes? No? Yes? Basically, an attribute is an additional piece of information that's carried with an element. If you look in the mark-up where you see these attributes occur, [you'll see that] it's in the start tag for that element. See, here in our Chapter we have an idea of CHI, [which is] just an ID that's attached to that. On our Emphasis element down here we have a Type attribute, and this one has a value of "I". What type of emphasis is this? In this case it might mean italic and so on; it's additional information that is carried with the element, whether that element be your highest level element of the document or something [else]. It's small down here as one of the characters in the paragraph.

How you define attributes in the DTD is like this: this line might look somewhat familiar to how we defined our elements; we have the angle brackets enclosing the entire declaration and we have our exclamation point, and what we're defining here is an attribute list. What we do is we give the name of the element that this attribute refers to, or is attached to, and then we name the attribute and give it a valid value or set of values.

Looking back at that simple mark-up that we just had — where we had the Chapter and Emphasis both with attributes on them — we have our Chapter here. We have an attribute list for our element Chapter; the attribute name is "ID." What does it contain? Some Data. Then, down here on our Emphasis element, we have an attribute list defined for [inaudible]. We've

named it "Type." What are the values that you'll find there? Well, here we've defined an explicit list, and you will either see a value of B, I or U as a value for that type attribute.

How attributes are used is a little bit more interesting. There are sort of some general, generic uses of them and then there are some more interesting ones that we'll look at also. In a generic sense or general sense you can see attributes used to carry just additional information about that element. And here we have, say, our Emphasis type as italic. We're just implying generic formatting.

Again, with SGML we are trying to get away from holding on to that formatting information; but in some cases, if something's been emphasized, it's important to hold on to that because you don't want to lose the fact that there was something special about it. Say, for a picture, you want to just store the dimensions of that particular graphic. You can do that. You can define a height and a width attribute to store that information. What we see commonly used, even in HTML, are external file references, and in this instance what we have is a graphic defined, and we're going to just specify where that graphic occurs. And with our SGML, again, we're dealing with just text; we can't store the graphic information in the file. We just link to it, so we have a pointer out to that file. So these are sort of general uses, just additional information that can be carried with those elements.

[There are also] some more uses of attributes that I think are a little more interesting, and you can get into some more Abstract ideas rather than the concrete measurements, say, that we had on the pictures and the examples before. With attributes you can include information in your documents that really can't be stored anywhere else, such as these Abstract concepts of, you know, what's the status of this document? What's the security level of this paragraph? What user level should be reading and accessing this information? And this can be really, really useful.

Say we happen to store all this information in our document at all different levels. We have Top Secret, Classified, and Unclassified as well as Beginning, Intermediate and Advanced-User levels, and we store it all in one document. What we can do is go out and automatically assemble a book or a new manual or a new chapter that specifically fits the needs of those people at the advanced level that have, say, top secret clearance. And it's that type of information that you can use and store in your documents that really makes using these attributes much more interesting rather than explicit and concrete information. You can get more into these Abstract ideas.

Another thing that you see widely used is this idea of a cross-reference. I kept this under the Abstract idea because you're really building a relationship between these two items. How we see this come out in our browsers or our viewers are hyperlinks, or hotlinks or hotspots, whatever you call them. You have a point in a document where you're referencing something else; well, there's a unique relationship between those two points in the document. How that's represented in the SGML is through attributes where we have, at the reference point, an ID attached. In this case, at some point in the documents I've said, "See Table V." I have a rough idea of Table V, and then later on that Table I have the same idea attached to it. That's what's creating that unique link and allowing you to bounce and hotlink through your documents.

So attributes really add a lot of value to our documents. Again, you can store this more abstract information about the different pieces of information, and we could even go further and help us to use the attributes in our search and retrieval. Maybe we don't have the explicitness at the element level, but we could possibly use attributes to help us do that. Or, just in reusing that information or applying formatting at a later time, we could maybe look at the attribute level to help us decide what to do with that.

We have one more topic to cover on the SGML level, and that's the area of "entities." This one I'll do fairly quickly. An entity is basically a unit that's defined that represents something else. That something else really can be anything; you can define an entity that represents a special character like a Bullet, an Omega — something that you can't represent as text in your document. It can also represent just a simple string of characters, just be used as a simple string replacement or for an external file reference. You see entities used both in the DTD and in your mark-up, and we'll look at an example of each of those and how they're defined in the DTD. Again, we see this similar syntax. What we're defining here is an entity; we name that entity, and then following it is what that represents. It's pretty simple.

Here we have an entity that we're defining in our DTD. We're calling that entity SGML, and what that represents is the "Standard Generalized Mark-up Language." Then later in our mark-up, on our [inaudible], we have a Paragraph. We're going along, and instead of typing out "Standard Generalized Mark-up Language," we just make reference to this entity by using the ampersand followed by the entity name followed by a semicolon. That is actually, at that point in the document, referring to this string up here. Okay?

That's one example of how you could use entities in your mark-up. We'll look at how you use them in the DTD. This, again, is just a simple string replacement. What we're doing is we're defining an entity called "Paras," and the type of Paras that we have are Para, Note and Warning. Later — say we're within our section or subsection or third level section — we want to have the ability to reuse that information over and over, and we simply make a reference to that entity. So here we have an element section that contains a Title followed by Paras, and that could be any one of these. It just does a simple replacement. By using entities you can really gain a lot of flexibility. You can get away from having to do a lot of replacements globally in your files; if you need to change a phrase or a term or what-not, you can do it locally just in one location where that entity is defined rather than throughout all your files. It can also help you to build a framework within your document structures.

Say, in that last example, that we defined a set of Paragraphs that could occur at many different levels in the document. Well, say we want to add a new type rather than going to all of those different declarations that would reference that; we would just have to change at the entity declaration level what types of Paragraphs we may have. If we want to add a Summary Paragraph it would be a very simple addition. It also helps you with consistency; you're always sure a specific item or phrase is represented properly.

You may be asking, "Now, what about HTML? Enough about all that detail — let's get down and let's look at how this really related to our HTML." What I'd like to do, based on what we have just learned about the elements, attributes and entities, is take a look at the HTML DTD and walk through some of it so that you can feel pretty comfortable reading through it and understand what is actually going on there, and see what features HTML does and doesn't use. In that hand-out, the back two pages, I've actually included excerpts of the HTML DTD so we can walk through some of this together.

I will note first that this is not the entire DTD. What I did, as I said, was get rid of a lot of the stuff. For discussion purposes we don't need to look at everything; we want to look at the main structure, the main elements that are being used, and kind of clean some things up to make it easier to read. So this has been modified and I've noted that on your document.

At the very highest level of our document structure for HTML, we have an element called HTML. That's something I didn't mention that I do want to point out. What are these characters following? Our element names? We have a bunch of "O's" here, and this is an optional feature of HTML that allows you to minimize the number of tags you're using in your mark-up. In this case, or for this application, this optional feature is being used and we've

specified for the HTML highest-level element our Begin and our End tags are both optional. If you were to see a dash in place of that...

[Tape change]

Diane Sandstrum: ...back in position is required. So it just kind of cuts down on the number of tags you actually have to have in your document. So, going on, let's look at the content of our HTML element. What do we have over here? It looks like an HD reference, which is using that percent sign followed by the entity name. That entity is sitting down here. HTML content contains what? Head and Body. So let's look at Head and Body.

Head contains Head Content, Body contains Body Content — we're not getting anywhere very quickly here. You'll find as you go through this that a lot of entities are used, and you always have to find — once it's been referenced you have to go and find what that really means. So let's flip; I'm actually going to flip to *Word* so we can browse through this a little bit more.

So, where were we? We found out that HTML contains a Head and a Body, [and we were] looking at the Head and the Body elements and their entity declarations for their elements. We have a Head Content reference, and down here I have listed most of the entities that we'll be discussing all in one section. Head Content contains what? A Title and then IS, index-based, and the next ID, [which is] some indexing information that we really don't need to be concerned about right now. The main thing that we're looking at here is the Head Content that contains a Title; then we go look at our Body element here. Our Body element contains this Body Content entity. Well, what does that represent? Here it's a long list, and a number of other entity references are being made.

I did a little homework for you and I summarized most of the main elements that are actually being referenced, [the ones] that you see used and you mark-up often through these different entity references. The Heading entity reference represents this list of Heading elements, H1 through H6. So you can have six different types of headings, followed by syntax elements and Paragraphs. Looking down here at a Paragraph element [we see] an "OL" and a "UL," which is actually used for an Ordered List or an Unordered List.

And then we get down to a Data level of elements, things like PC Data — which we saw before, which is just your data in your document — and then things like "BIM strong." Those are all the emphasis tags that are placed to indicate the emphasis, things like A which is your Anchor, your linking reference. We'll take a look at some of these a little more.

[Next we have] Images and Line Breaks. There is a lot more that actually can be contained in there. I didn't list them all, but just sort of the main ones that you really see used. One thing I would like to point out, though; here, at this level, is really where we're getting into the gut of our document. We have Headings intermixed with Paragraphs intermixed with Data intermixed with Anchors intermixed with Emphasis — I mean, it's really just sort of a random — everything is separated and used using this [inaudible] bar to separate it, so it's any of these things in any order and there's no real structure that we're getting out here. Once we get to the bulk of this DTD there's a lot of possibilities, but there's no structure. It's really a free-flowing, free-for-all structure.

Here's just the rest of these entities that were referenced up here: the Heading and the Text, where I pulled some of this information from. Let's look at our Paragraph elements. What do we have? We have one Paragraph element called "P," and that contains our different text options that we have. Just to refer back to our Text entity reference, our Text entity is defined here as PC Data, an Anchor, an Image, a Break, some Phrases and Fonts — and it expands further.

At the Heading level we've defined all of the Heading elements to contain the same type of text. We're actually using — this is something a little different, the entity reference to define all of the elements. So they're all being defined.

Here's our Lists, and I've taken some of the stuff out of here. There's some more attributes and some things on them that weren't that interesting for discussion right now that have moved to a different place; but the Unordered List and Ordered List just contained List items and so on.

Here's our link mark-up. If we go down a little more to element A, it contains some content which is either a Heading element or a Text element. So the Anchors can contain Headings, the Headings can contain Anchors — there's no control in place there at all. It's just sort of... It can spin off and next there's no control structure at all. But within the Anchor element it's using a number of different attributes to carry the information about the link. And there's attributes that are defined below here.

What's more interesting, though, is showing how they're used. It's a little easier to read up here: the name of the reference, what this Anchor point is or what the element is that's being referenced somewhere else. The "A" tag is used both as the Anchor and as the Reference point, just depending on the attribute that you use, whether it's considered a reference or an anchor. I should also point out that in the DTD you see these within angle brackets: an exclamation point, dash-dash, and then towards the end, over here, before the close of the tag, another dash-dash. That just denotes a comment, so it's ignored by your [inaudible] or your processor.

That's really about it. At this point I want to cover the images, and how the graphics are represented. It's a place folder; you have an imaged tag, and then a reference made to the file where that graphic sits, and as far as the main elements that you really see and use, that's about it. At the highest level of the document you have this free-flowing structure going on where there's no control of where anything goes.

Does anyone have any questions about that?

W: [inaudible]

Diane Sandstrum: Sure, sure. Let me — actually, that's a good example. It's better to show you in here because we'll see an example being used and not used. Okay, I should have turned off the [inaudible]... Characters are showing up as a dot right now, so just ignore this; but this is this "tag minimization" feature, and what this allows you to do is specify for any element whether or not the Begin tag or the End tag are required or optional. How that's represented in your declaration is [like this]: following the name of your element you have two slots, basically a slot for the Begin tag specification and for the End tag. Using an "O" means that it's optional.

So we could have an HTML mark-up instance that never has the tags "HTML" at the beginning and end. They're both optional. But when we get down here we bypass the Head, we bypass the Body and we get to our Title. The Title has a dash instead, so you have to have a Begin and an End tag for that element.

M: If my understanding is correct, [inaudible].

Diane Sandstrum: Okay. What this is — I pulled it up in Word only because I wanted to be able to bold some of the items, that's the only reason — this is a pure text document, and all DTDs are just pure [inaudible] documents. Within them you're defining elements in the structure. And I just chose to display this [inaudible] document in Word.

M: [inaudible]

Diane Sandstrum: They never actually have to send — right, because that's assumed that you're using that HTML tag set. The browsers have the knowledge of the HTML DTD basically built in.

M: [inaudible]

Diane Sandstrum: Actually, at the Paragraph level you have to have a Start tag. Many times you see the End tags left off. Something that's interesting, though, about the optional tags is that you can get into a mess very quickly if you don't use it properly, because it's very sensitive to the context that you're in. If you say that something is optional, really the only place that you can do that is where there's no question about what that element is going to be. You get to a Title; well, that means that if I'm in a Title, I have to be in an HTML document and a Heading. So I don't need those tags; that's just assumed because that's the only place that item occurs.

W: [inaudible]

Diane Sandstrum: It might. It might depend on the browser, on how the browser interprets that. Some might not allow for some of the features, and there is not — there's a common ground. There's a common set of tags that are being used here, but there's not necessarily common applications of that being enforced.

M: [inaudible]

Diane Sandstrum: Right, there's definitely subtleties made, sometimes subtleties and sometimes major differences between the different tools and how they interpret the information that's there.

Okay. Before I close up, does anyone else have any questions about the syntax here, or do you feel pretty comfortable kind of traipsing your way, getting a feeling for what's going on? We're not going over everything in here; we could spend days in here learning about this if you really want to, but I don't think you do, at least not at this point.

So, okay, we've looked at some of the basics, and looked at the HTML DTD. Let's see what features HTML is actually using and what it's not doing. [What it] does do really well are cross-reference links; that's really what a lot of the excitement is about, that we can link to all these other locations and all these other places very easily using those attributes and the information that's stored in them to create the unique relationships between the different places of the link. It also makes use of external file references for graphics images and many other items that you can pull in. And entities [are linked] to a certain extent, mainly within the DTD, but I don't necessarily think that I even agree with how many of the entities are defined and used.

In my opinion you usually define an entity to use in the DTD because you're going to be referencing that in many locations. A lot of times what you find in HTML DTD is that it's just defined and used in one place and it's not an effective use; but it is kind of going towards developing that framework. So if you did need to build off of that, you have some references that you can make.

M: Excuse me. Is there a fixed set of [inaudible]?

Diane Sandstrum: I think that the HTML DTD actually references one or a few of the ISO character sets.

M: Did you take any of them out of here?

Diane Sandstrum: I didn't take anything else out. This is an HTML 2 DTD of what's accepted right now. I don't know what's being proposed; I think maybe HTML 3 has more. I'd have to pull it out and take a look at it. But what HTML does do really well is that it's providing us a backbone. It's giving us, in the sense of an SGML application, a common backbone that we can all build our documents off of. We're all using the same set of tags and — granted, there's not much structure there — but we're all at least using the same tags, and that's a good thing.

What HTML doesn't do is define any kind of hierarchy, and we'll take a look at that. It's a very flat structure that we just saw; in fact, there's no enforced structure at all, really. Anything can go anywhere in the document, where nothing is really required with the exception of the Title element. That's the only thing in your document that is required. It could be an empty Title, but those tags at least have to be there. And there's really little variety of elements other than at the Heading level.

We do have six levels of Headings that we can use, which is pretty good, but outside of that we're really limited. You get into the content of your document and everything's thrown into that "P" category, that Paragraph category, and there's no variety or distinction made there and it's not making use of attributes to be able to pass along this more abstract information in your documents. So it does a lot of things really well, and in my opinion it falls short in some places where there could be some more there to give us some more functionality and make some more features available to us.

[How do you build] SGML hierarchy? We can go wild, actually. You can build hierarchies as complex and strict as you need them to be — or you don't have to. Your hierarchies that you build and the rules that you set up don't have to be necessarily that strict, but they can be if you need them to be.

Here's a look at what a complex HTML hierarchy could look like, and the interdependencies and relationships between the elements. This is what our HTML hierarchy looks like. I wouldn't really even call it a hierarchy; I mean, we have HTML Head, Body, here's our required Title and now here we just have a swimming pool of elements. There's really just a free-flowing lack of structure going on out there.

Looking forward, we'll kind of look at the question again that Eric posed: Why not use SGML on the Web? Why is that not a very good option? And the other possibility: How can HTML evolve with SGML? We'll talk about some of the things that are proposed in the HTML 3 DTD. And why wouldn't we want to use SGML on the Web?

There are some tools out now, things like *[Panorama] Pro* that allow you to read and view your SGML documents, but there's still some set-up that's required there because you don't know what set of tags are going to be coming in or what the DTD is for you to create an environment where you can view that acceptably. Then there is some work involved for each specific application there.

A better approach, as Eric proposed, could be this: if you need to use SGML, then that can be more the center of your repository and HTML can just be one of the forms that you publish that information in. Another thing that can be explored is empowering HTML a bit more to use some more of the features that are available to it with SGML, such as maybe not making it as strict as some SGML applications that are out there. We don't want to go that far, but maybe we could come up with some kind of balance between the two where we get some more of the features and not necessarily make it too strict or enforced.

What Eric proposed is that we're leaving HTML as a backbone structure but utilizing more of the power of SGML. Many of the features can be optional and only used if you choose to use them. He used the example of the TV signal, with the color, surround-sound, home theater system compared to your small black-and-white TV that you might have. And what does this really mean for HTML if we try to pursue this route? What we would need is a reasonable framework for searching and linking, but with no real structural constraints placed upon your documents or defined in the DTD. We want very few required [inaudible] if we want to meet Eric's acid test of being able to put out a statement of "Hello, world" without having a whole suite of tags in place to mark this defined structure. We can use a simple tag set, but then we have some optional classifications allowed for those users to want to develop a more sophisticated occupation.

So we might have something on the structure side in setting up the relationships between the elements where you have a very simple and flexible structure, where you might have one structure defined that could be accessed at many different optional levels versus something that's really tight and rigid. Make it a little softer on the outside and make some of these other features optional.

Making a reference back to the black-and-white TV signal that everybody can understand and that would be compared to our base level HTML — anybody can read it, but then for those people who have more advanced systems and care to delve into this, they may have some added richness to allow them to access the color, stereo or close-captioning, or on the HTML side things like tables, equations or user-defined objects.

This could be done possibly — well, we talked about the riches that you can get from defining the different types of elements either through your element classifications or the possibility of doing that through attribute specifications. So let's say that we have our "P," the Paragraph element of class; the default we could define as Para and then we could have all these user-defined classifications that we may choose to use, but it doesn't matter if we don't. And if someone is reading our document that doesn't choose to go into that richness, they would see everything as a standard paragraph.

I'd like to just point out some of the things that are in the HTML to read, [some things] that have been proposed, and kind of the direction it looks like things are going. Actually, the documents with this DTD can be more robust in many different ways. They've added a class attribute, and we'll talk about that. They've added the ability or proposed the ability for tables in math which we didn't have before. If you had a table structure, in your HTML 2 you're forced to format it and make it look — you know, with tabs and spaces and what-not so it looks something like a table, but you've lost all the integrity of that structure there. That's allowing for text flow around figures and tables so that you can get more complex published documents.

There are more element types even at the Paragraph level; there are some things like a Note or things like Warning, I believe, that are creeping up that give you a little more variety at that level, but maybe not as much as you may need for your specific application in your documents.

Let's look at this class attribute. I believe it came straight from this proposal that Eric made that we be able to, at the element level, give the users the ability to specify what type of element or subclass this is. So we may be able to take a Paragraph or "P" element and classify it as an Intro, Abstract, Summary or Preface.

This has actually brought up some kind of controversy around this, because people have said, "Well, what if we want to take this even farther? What does, say, an Abstract mean? Is that necessarily an Abstract that occurs at the Intro part of the document or do you have an Abstract somewhere else? Can you specify the context that those elements sit in?" And it gets into this debate between getting into structure or focusing on just the element types. I don't

think that there is a clear answer for this; they've talked about, actually, within this class attribute, using periods to separate elements so that you could specify a context, so you might have a section-dot-title or a subsection-dot-title so that you can make a distinction between them.

This, I think, is still probably much up for debate as to what the proper usage of this particular attribute is, but the idea that it's theirs is actually very exciting, that we can possibly use this to our benefit to help further define the elements in our document. And even if we don't get to the structure level, to where we're saying, "this is the Title within the Heading," or, "I'm sorry, within the Section or the Subsection or Sub-subsection," just the fact that we know that it's a Title is very powerful, or [just knowing] what type of Paragraph it might be.

A couple of other things that are happening in the HTML 3 proposal are some more formatting-type features. I've got some mixed feelings about some of these. There's something called the Style attribute which allows you, as I understand it, to specify how this should be formatted or how it should be presented in the viewer that you're using. There are overrides that are available, but you're basically trying to control how this information is going to be viewed by the end-user.

M: Is this style [inaudible]?

Diane Sandstrum: That's a good question. I actually haven't made use of that particular attribute myself. As I understand it, it's more carrying the Style information, how it should be displayed by the browser. I don't think it's actually referring to an external [inaudible] because it's more element-specific than document-specific, as I understand it.

M: My understanding is that [inaudible].

Eric Severson: Yeah, this is the same thing. The discussions have included things having the stylesheet imbedded, kind of giving a hint so that if you can recognize something like Bold in the browser, you'd say, "Got it, I'll implement my notion of Bold." So far as I know, those things are not settled yet, but this is the idea.

Diane Sandstrum: There's also an Alignment specification that can be made where you're specifying this should be centered left to right or justified, where you can basically put a permanent header on your document and things like information about the space that's required on the page for a particular type of element. Some of this information, I think, is very useful because it's really getting more at how to publish this information effectively. Some of it, though, may be kind of pulling or pushing us away from a more flexible system and forcing us into allowing people to control the formatting and include that formatting information with the documents, when we're trying, in a higher sense, to really get at what the key components of this document are. Then the formatting of that falls into place and can come later.

It's just sort of something to think about, what kinds of controls — some people will find that they want to have that control. They want "This is going to be centered, I want that control." But it's just sort of weighing what's important about the information.

Some of the questions that Eric posed earlier that are commonly asked, again, are, if you have HTML, is there any need for SGML and can HTML be used as a center change format? Can I store all my documents in this format? And I hope that through Eric's discussion and some of the things that I've shown you, I think that these answers are becoming a little more clear. That, yes, there is a need for SGML. It might not be for you. It might be for someone else. But there clearly is a need for it outside of just the HTML application. But HTML in itself is not a good

format to put all of your documents in. That up-translation problem that you run into and what happens downstream, what are you really doing?

I think the answer to these questions really lie in another question to you that you really need to really think about. And that is, what are you doing right now or what do you plan to do with your information in the future? And maybe the possibility of using some of the additional SGML features, you may be able to benefit from this and maybe not to a full-blown SGML application, but just kind of thinking about how HTML and SGML are moving forward together and that we can actually help to guide that.

I think many people are finding themselves caught up in the limitations of HTML. The whole idea, though, is that HTML was designed to be simple, and as it's evolving we might be able to take advantage of some of these other features that we're enabled with. And keep in mind that SGML is always an option for you, putting SGML at the center of your solution and using HTML as one of the published formats that come from that central repository. That might not be for everyone.

What you need to think about is what are you doing with your information. It might be something, not to the extent of SGML, but rather than authoring everything in HTML, maybe you'd look at authoring them in a structured word processing environment and then filtering that information to HTML. So you always have that original source to reuse in different ways rather than taking it down to that bare bottom, lowest common denominator of HTML where you won't get as much reuse and access to that information later. And that's the whole point of this in the first place, is access and reuse of this information.

Just remember, it's not a battle. HTML and SGML are not fighting each other. They really can work well together. There are a lot of powerful features that SGML gives us, and HTML is just sort of tapping very lightly into those. Where they're going to go and how they're going to evolve, I don't think anyone really knows. But as we're looking at how we're going to develop our solutions for our information, these are just all things that we need to be thinking about.

If you would like to find out more specifically about SGML, we do have training courses available through InterLeaf. There's a number on this handout here that you could call if you wanted to get some more information, and we have different types of classes that you could look into if you want to find out a little bit more.

W: [inaudible]

Diane Sandstrum: Yes, you can. There are a couple of different approaches that you could take to do so, whether it's a conversion process that you take that document through to put it into, to take this rich SGML format into HTML. And something that I didn't actually tap into were some different ways and other approaches that could be taken for that. A lot of this is up for discussion.

What is the best way to make this link between SGML and HTML if you want to do both? The link could possibly happen from either side. There could be something that's controlled in, say, the DocBook DTD that would enable you to provide information about, well, this is what this is in SGML. I mean, that's clearly defined; but what would that mean if I were in HTML, or what element would that map to?

Eric Severson: I was going to say that one of the important answers to your question is to say "no." There is, in fact, not a standard way to do that, and that's part of what we're saying in adding some color to the factual stuff of this tutorial. What you have to do is you have to be

thinking of DocBook as, “how do I take DocBook and compress it down to what I can express in HTML?” And far as I know, the DocBook people have not formalized anything like that yet.

There are various ways, as Diane said, that you could implement that, but there is no standard method, not just from a technical implementation standpoint but even from a mapping [standpoint]. There might be disagreement as to what element goes where in HTML, but I’m proposing that if you’re not thinking of it that way you’re going to end up with two different worlds, and you really do need to relate them, even if only conceptually, so that you can make that translation.

W: [inaudible]

Diane Sandstrum: Yes, actually, there are products out there. InterLeaf has a few different approaches that you could take if you have SGML information that you wanted to get into HTML. We have a product that would work directly on the SGML called *SGML Hammer*, and you can basically map these elements through these procedures. You specify for this element, make this output, and you would do this conversion from SGML to HTML.

There is another approach with the InterLeaf products that you can take. There is an InterLeaf SGML offering tool and application tool where you can bring your SGML into the InterLeaf environment. The whole idea behind all the InterLeaf products is to focus on the structure of the components of your document. Once you take this SGML into this InterLeaf world, per se, there are other tools; we have *Cyberleaf Tool* that automates the conversion from any word processing format basically to HTML.

But there’s another route to get to the HTML from your SGML. You can either do the straight conversion or go through a structured word processing environment to do that. And so, yes, I don’t think it’s necessarily widespread, but there are tools that are available and I think the more tools that are out there that help that process the more people will begin to look at this as a viable option for them.

Eric Severson: And, again, a point we’re trying to make is that with *Cyberleaf* or other tools that start from word processors and go to HTML, there are two ways you can look at that. You can look at it as kind of a legacy data conversion tool, and “let’s get this junk out of the word processor and into where we want it,” [into] HTML; or you could look upon it as sort of a production process, a publishing process that says that every time we need to fill the buffer with HTML, so to speak, we use this to go from our actual source information into whatever the latest version of HTML happens to be.

W: [inaudible]

Eric Severson: Well, then you maintain control of your source data, isolating yourself one step from all of the variations that are going on in the HTML world, plus you also are able to control your use of HTML in a standardized process so that you don’t have a hundred different people doing a hundred different things with HTML. As you get into things like formatting attributes and things that really bind a particular format or viewpoint into the HTML, you’re going to basically end up with an out-of-control situation.

M: [inaudible]

Diane Sandstrum: It could be done, actually, with a combination of products. I would think some type of our DM, which is our Document Management piece, used with something like the *SGML Hammer* to automate the conversion of that as it's being put into that repository.

Eric Severson: An InterLeaf specialty, I should say, is to set up these kinds of production processes at whatever scale — production sounds like a pretty high-level scale — but I mean that in the sense of, “I do it and it could be I do this in *Word*, or a simple use of the InterLeaf authoring product, and then I punch a button and bang, bang, bang, I go out and I serve up a chunk.”

What's missing, I think, in the InterLeaf product line right now is really the Web server connection. That's something we've identified as an enhancement, and you can look out there and see who's here, but I believe there are some other early entrants into that, solving that kind of problem.

M: [inaudible]

Diane Sandstrum: The product, the *SGML Hammer* product, would be best served with that and it might be in combination with something or some kind of document management layer. But the *SGML Hammer* is a batch processing tool that could handle that.

M: I have a technical question about the standard. In the SGML standard, is there anything that stops you from declaring parts of your DTD in a document?

Eric Severson: I think the answer is no, there is nothing that prevents that. But that's part of the reason for that. What you do in the document instance is that you always refer to the DTD as an entity. Let me see if this is the answer to your question; I know what people have done is to refer to a main DTD with those parameter entities, and then underneath that redefine those parameter entities, and it takes the last definition. So, effectively, you're overriding in your document instance what the main template DTD had in it.

M: Is there a reason why you couldn't put [inaudible]?

Eric Severson: Yeah, that's a very interesting question. There's nothing in SGML that would prevent you from doing that. I'd actually have to think it through a few more steps to be sure of what the implications would be in my own mind, but I think the question would be, “would that provide a standardized enough mechanism that browsers could easily take advantage of that?” The answer is probably yes, it would, and it's really just a matter of the most practical way of setting it up so that browser vendors are likely to say, “Sure, that's easy enough. Why don't we just take advantage of that?” as opposed to saying, “Oh my gosh, how arcane. We're staying out of that.”

M: [inaudible]

Eric Severson: Yeah. By the way, it's an interesting example, the *Panorama Pro* product. I guess we didn't completely describe that. For those of you who are not familiar with it, *Panorama Pro* is essentially an SGML browser. It can be fired up under *Mosaic* or *Netscape* to deal with documents that are typed as SGML. The interesting thing about *Panorama Pro* is that it has a separate file that has to be defined by the user that essentially does this kind of mapping that I'm

talking about here. It's yet another example of how you might implement it. It's a map that says, "See this element called Abstract in the DTD? That is going to get mapped to 'P'."

About a year ago I actually rustled down a person at one of the WebWorld shows who was demonstrating *Panorama Pro*, and I said, "You've got to show me. Get out a Windows, let me see in DOS. Let's go down and look at what's underneath this, because I do not understand how you can simply read any SGML file as it's served up over the Net. There has to be something that provides this backbone." And in fact they were able to show me that same mapping.

M: [inaudible]

Eric Severson: The SGML world is working on a standard way of representing formatting or semantic kinds of information that can be attached to these generic objects. There is a companion standard SGML called DSSSL, "Document Style and Semantic Specification Language." I once did a presentation where I had Jerry Seinfeld in spirit adding a comment like, "What's the deal with the three S's? How come we can't get along with two S's like every other word in the English language? I mean, can't these people show any self-control?" But DSSSL, kidding aside, is formally the mechanism by which you do that.

The problem with DSSSL on a practical basis has been that it's so exhaustive and comprehensive that nobody has found a practical implementation. One of the things that *SGML Open* is working on between the vendors is actually to come up with some kind of subsetting of that which can make a practical solution. But *Panorama* right now has its own propriety. I mean, it's expressed in SGML, but it's its own application for styles.

Other questions? Anything that you were hoping you'd get out of this tutorial that you didn't? Well, I guess I'll take that as a good sign.

Diane Sandstrum: Either that or there's not enough time.

Eric Severson: Or you got nothing out of it. Yes?

M: [inaudible]

Eric Severson: I have in my briefcase, I believe, a reference on the Net to some of this. It'll take me a moment to dig it out, but I'm happy to do that if you want to stick around. That just came over in the last few days.

Well, thank you very much.

TUTORIALS INTERNET TOOLKIT FOR THE MACINTOSH



SPEAKERS

Kevin Savetz

Computer Journalist

Braddlee, Ph.D.

Network Information Consultant, NevadaNet

[Due to an equipment failure, the first ten minutes of this session were lost.]

Braddlee: I'm supposed to stand really close to you, so we'll just...

Kevin Savetz: Configuration stuff...

Braddlee: This isn't a very... because this job is not very sexy, it'll do redactive or delete different characters for erasing...

Kevin Savetz: So, so for example, if you're trying to edit something and you're in Control-H, Control-H, Control-H, that may be one thing that you would want to change — switch it from backspace to delete.

You can do, you know change the colors, and by-the-book information changes... and all of that good stuff. We try to... In Halifax, it's kind of standard you Control-F to pause output and you Control-Q to resume output. But if your using E-max or some other UNIX Editor that wants Control F to save, then it's a bad thing, because you could Control F to save and all of it's across the screen output. So, you can change those commands as you need to so that you can use the full functionality of your editor.

Braddlee: I think that pretty much shreds it for Telnet.

Kevin Savetz: If you're interested in Telnet or any of these applications, I don't know if Brad has said this — they are listed in your handout — pretty much everything we've talked about and more is in the handout. In addition, there will be an on-line version of this handout which we hope to keep updated on a more-or-less regular basis, and it will help directly link to all of these tools. So if you just put this one page's URL in your hot list, you will be able to very quickly bring up the most recent editions of any tool. And I will give you the URL [inaudible] that's on the screen.

Braddlee: Actually, it's on the list, on the handout.

M: [inaudible]

Kevin Savetz: Yes. And basically it will be an updated list of the handout that you have. Next up on our list of tools to talk about is FTP, which is the Internet File Transfer Protocol. Very briefly, FTP allows you to move information from a machine on the Internet to another machine; present programs or data, weather maps... pretty much anything. A very common use of FTP is something called anonymous FTP, which lets you go into a public server and get information, usually programs, that are available to the public. Not all FTP sites are open to the world — they're not all anonymous FTP sites, but those that are tend to be very popular. You go in there if you want the latest version of a freeware or shareware application. You can go in

there and download anything you need, including most of these tools that we're going to be talking about today. There are several different programs available for anonymous FTP, or FTP anonymous or non-anonymous. There two biggies are *Anarchie* by Peter Lewis, shareware and *Fetch* by the University of...

Braddlee: Actually Dartmouth, Dartmouth College.

Kevin Savetz: Dartmouth College. It has been... we'll look at both of those. It has been the case that *Fetch* hadn't been updated for a very long time.

Braddlee: Almost a year.

Kevin Savetz: Almost a year...

Braddlee: Which is a very long time for a lot of these guys.

Kevin Savetz: ... yeah, that's ten years in Internet...

Braddlee: Right.

Kevin Savetz: ... so, *Anarchie* really... it was still being updated and it... even if you like to interface with *Fetch* better, you kind of had to use *Anarchie* because it was the only one being actively maintained. About two days before the show started, I discovered that somebody's updating *Fetch* again. So it's in through 3.0 BETA — *Fetch* is out. So now I think there are about two viable FTP clients, and that's a good thing, so pick one. We'll also do a quick look at *SnapSure*, which is a commercial FTP client — which is fine. Frankly I like *Anarchie* better, but to each his own. We'll look at all three of those. Should we start with *Fetch* ?

Braddlee: Take a look at *Fetch*.

Kevin Savetz: Do you want to look at the old one or the new one?

Braddlee: Let's look at the new one, because I think... it seems to be stable enough. Some of the things that we are going to show you are Beta. Part of the reason we're doing that is because we want you to see what's current. If there is something that's Beta, chances are there will be another non-Beta release version of that application. We'll tried to let you know that on the handout, and give you pointers to both. That will also be true on the Web site... that you'll have directions to both and you can get either one. But, if we're showing you the Beta (maybe you want to move away from the fan, if you can't hear, come on over here and you'll be able to hear okay. I think they're still, they are still trying to work) anyway, so if there is Beta that is stable, we will show you the Beta...

Kevin Savetz: And, occasionally, if it's not stable, but if it's really interesting, we'll tell you about it.

Braddlee: That's right.

Kevin Savetz: *Fetch* — this is the opening screen for when you run *Fetch*. So you can open up a connection, and in the newest version, there are shortcuts so you can save bookmarks to your

favorite FTP sites that you go through commonly. I'm going to open up a connection to an anonymous FTP site... gave it the host here — just write anonymous and it asked for my e-mail address, and I put okay.

What you are about to see is... this is the main *Fetch* interface. It's about to bring up a list of files available, actually it's folders, at this FTP site. And this is pretty [inaudible]. You flip the folders, and if you want to go to a directory, different directories, such as this public directory, you double-click on it and a little dog runs and it's all very cute and nice. Then you can go into the mirror of the InfoMac archives, for the files of the Macintosh.

Braddlee: You may want to explain, just real briefly, what the InfoMac archives are. Okay. Basically InfoMac... there is a collection, a distributed collection of Macintosh resources — not just for Internet stuff, but pretty much in any area that you would be interested — and called InfoMac.

There is the home InfoMac archives which is AMISH...

Kevin Savetz: Stanford.

Braddlee: Stanford, okay. But there are mirrors of that archive across the network. The one that Kevin is at, at the moment, is America Online. So really what you can do is — one of the things you'll see in *Anarchie* is there's a list of different bookmarks for the different InfoMac mirrors and always feel free to shop around for the one that will actually let you in, because they all tend to be busy. But they are a great resource and a great set of tools.

Kevin Savetz: Mirrors are a great way to get into a site which is overloaded because it is very popular. I happen to like the one in America Online: mirrors.aol.com. Because it's relatively new and they've got a big server, and they're... it's usually pretty easy to get in, especially versus the real InfoMac archive, which is very, very popular. I've navigated here to the virus directory. This is not viruses, but a virus protection tool.

Braddlee: Gosh.

Kevin Savetz: Yeah, and if you, for instance, want this *Infection*, which is a great three-word virus program, you can click on it and get the file. We'll go through the motions of actually downloading it to your computer. Oh, this is cute.

Braddlee: Yeah.

Kevin Savetz: This is the first time I've used this version of the program, so I'm just as surprised as you are. We save it to the hard disk and the cute little bar graph is going to tell us how far we are into getting the software.

Braddlee: And it will tell you things like just how slow your PPP connection is, and...

M: [inaudible]

Kevin Savetz: The question is, "Why does your bits-per-second change in the estimate. And, I think it's pretty much true in any program. In my experience, the more information it gets, the better it can make a judgment on the average of how fast it's going. It's not that your speed is fluctuating,

it's that it actually has more time and more information to base its guesstimate on. It's trying to make an average. You agree?

Braddlee: Yeah.

Kevin Savetz: I just made that up, so...

Braddlee: No, that's accurate. Yeah. Or we're both wrong.

Kevin Savetz: So anyway, we're getting into the program, and as with any FTP... pretty much any single FTP for Macintosh, you'll find that it is compressed and stuffed in an archive and you need to uncompress it. And there is a great freeware program called *Stuffit Expander* — which if you don't have it, you need it. You get your things that you downloaded, you drag and drop it onto *Stuffit Expander* and it miraculously uncompresses it, whatever it needs to do and then you can actually use the uncompressed workable product... there's a question?

M: [inaudible]

Kevin Savetz: Is there a danger of viruses in the FTP? I highly recommend using *Disinfectant*, or whatever other program you want, to virus check any program you download before running it. You can get a virus from any program that you run. Well, this is going to change, but in general, downloading a text file [inaudible], GIFF file... programs can. Recently some brilliant person came out with a virus that works in Microsoft Word 6, that is basically a virus that works within the macro language, which apparently can be kind of screwy, but if you don't use Word 6, then it's not a problem.

Basically when you download anything, you should virus check it first. In my experience, I have never had a problem. I use the major Macintosh software archives, and generally they do virus checks before putting it on-line. However, don't trust them. You don't know if the guy was in at 3 a.m., and the person doing the archives was hired to virus check it... it's not worth the hassle if your hard disk gets corrupted.

Braddlee: And something I try to do — I've been doing Internet stuff since about 1988 — and in that time I've acquired one virus, and that didn't come off the Internet.

That actually came from our Apple Rep. However, I do use *Disinfectant*. I almost never find anything unusual, and once in awhile it will ring a false alarm. But I run it just because I would rather do that on a regular basis than be stuck, and *Disinfectant* is a very good tool. Another thing that we try to do is go to the source. Go to the source: if you're going to get a copy of NetScape, go to NetScape.

Kevin Savetz: Get it from NetScape, rather than from...

Braddlee: From a hacker or a pirate.

[A brief portion of the tape is blank.]

Kevin Savetz: You used to have to enter every single Internet program that you ever got. With *Internet Config*, you tell it all that information and then, if you have *Internet Config* compatible applications, they will ask *Internet Config* for that information and therefore save you the time and the trouble of entering that stuff into each new program — each new version, ad nauseam.

When they first came out there weren't any *Internet Config* compatible programs and I would say there are about five or maybe ten now...

Braddlee: All the Peter Lewis programs because he wrote *Internet Config*. *Fetch* is. I think [CUC] might even be...

Kevin Savetz: So, it's an open standard, and it's becoming more popular. And, I think, in the long run, it's going to be a way to save us all a couple minutes of going "What was my new server again?" and typing in `news.screws.net.food.bar` or whatever it is.

Braddlee: And it will also — for people who set up machines for other people — allow them to set up the machines and configure them once and then the users will be able to add new applications, and not have to wrestle as much with configuration.

M: When downloading stuff, I noticed that in a browser, sometimes it will do "FTP colon" or, now that it's going to just use FTP to acquire things — is this maybe a trend toward just going on a page and just clicking on a reference? The program comes down to your Mac, it unstuffs itself and then it installs and sets itself up automatically.

Kevin Savetz: Right.

M: Day by day it gets easier.

Kevin Savetz: Yeah, things are getting easier. I think there's a trend, we're slow... I don't know if we're ever going to get all the way there, but I think things are slowly moving to the direction that you're going to have one program, be it Netscape or some other Web browser that can do FTP within one program. So, if you want to — and there's a link so you can click on it — FTP will uncompress it, and then you can install it right then and there.

But, at this point, there are certain functional advantages to using a dedicated FTP program. For instance, Netscape cannot upload FTP programs. Also, Netscape will give you one thing at a time. If you want to download all 20 of these virus programs, you can't do that in Netscape. But under *Fetch* or whatever, I can select a range of information and download them all at once — if you want to horde software and set up your own archive or something like that. So, I think very slowly we are moving towards an innovative package, and I know that in the newest version of Netscape Beta [it] will do e-mail, as well, and has a better use.net news group interface. So one day it will be one 12 megabyte program that will do it all. But for now we're not so lucky. So we have to have these conferences and talk about the differences. Besides variety is the spice of life.

Braddlee: That's correct. There's also two perspectives on this. One of which is sort of the Swiss army knife, Netscape is the only tool you'll ever need kind of perspective; and then the other, which is the you'd kind of like to have a tool kit where you have different tools, even though they may have been designed by different people and work somewhat differently, [each] has its own unique attributes and features that make it more or less endearing than something that's maybe a little bit more homogenous.

Kevin Savetz: This is *Anarchie*. This a shareware program by Peter Lewis. One of my favorite things about *Anarchie* is the About Box. The more you download, the better rating you have. Currently, on this machine, I'm a Power User. It starts you up at newbie and you get to Power

User, and on my Mac at home I'm currently up to Net Destroyer. I'm not sure if that's good or bad, but anyway... *Anarchie* comes with a much more complete bookmark list than any other FTP program that I know of. So even if you don't know where you want to go, or you're just kind of cruising for good stuff, there's just this huge list of yummys out there on the Internet.

To show you interface, I'm going to go to the same site that we just went to before so you can kind of... we'll get *Disinfectant* again. So I'll hit "list". I happen to like this interface here, these boxes can tell you how much more downloading there are and [that] you need to have. We'll click on the viruses directory here and we'll bring up a separate window, which is kind of nice because if you go, "I really didn't want to be there," you still have this other window that you can pop back to. (The T-I all to ourselves, and we're still waiting.)

So here's *Disinfectant*, we'll double-click on it, and it will download the program once again. So the interface here is Mac-like. It's a heck of lot better than using a command-line FTP interface, which is just a horrible experience, and if you've never had to do it then good for you.

Braddlee: I do a lot of construction, introductory UNIX Internet classes for people in Nevada and pretty much I can figure — if we are teaching people how to do UNIX FTP — it takes about an hour to cover the basics like how to get a file down — and particularly if they're doing it in DOS.

Kevin Savetz: In the olden days, like, a year and a half ago, if you were downloading anything, you would have to download it to a UNIX machine and then transfer it to your Macintosh, and that was just a huge pain. So, here we go, we're downloading something straight to the Macintosh. It'll be here in 54 seconds and, it will be safe from viruses of all types. And we're very impressed. Okay. We'll abort, and go on to...

Braddlee: Now, did we actually search for anything?

Kevin Savetz: Oh, you're right, I forgot the...

Braddlee: The fun part.

Kevin Savetz: ... the fun part. *Anarchie* is a combination FTP client we produce on, also a *Archie* client. *Archie* is an Internet tool for finding software on the Internet. If you know that you're looking for *Disinfectant*, or whatever, and you don't know where it is, you can just type in *Disinfectant* and it will give you a list of where they are, and then you can just click on one of the things and it will send it right to you.

Integrating *Archie* and FTP is just a brilliant idea, and I've never seen it done anywhere else, and we... this is still one of the things that Macintosh people can do that Windows users can't do. Not that it can't be done on Windows, but no one's sat down and wrote the program. Do people understand what *Archie* servers are? Okay. *Archie* is a system which systematically checks public FTP sites for the files that are available on them and then indexes them by the name of the file and by its location.

So, by using the *Archie* client on *Anarchie*, will select one of the 10 different *Archie* servers that have these databases of information, which should all be fairly similar. You don't really have to worry about choosing an *Archie* server on the basis of the content. It's pretty much choosing on the basis of traffic, whether or not it will let you in. So that you ask the *Archie* client what the name of the file you want is — for example, *Disinfectant* — and so it's going to take a look

at the *Archie* server at *archie.internet.net*. He has currently selected it as a substring so that it will look for *disinfectant.hqx* or *Disinfectant* whatever else.

Braddlee: We'll try to do it using two different servers at once. Neither one is talking to us.

Kevin Savetz: Right, neither one is talking to you. In looking at *Archie*, if you see down at the bottom of this, the barber pole or just above the little barber pole, there is a finish guesstimate. It always says 15 minutes to start. If it stays at 15 minutes for more than a minute or two, you're basically not getting anywhere. One of the ways you can tell that you've actually made a connection is when you've got a packet received. If you don't start seeing two packets received within a minute or so of the time that you connect, then it's probably good to try another site. The ones that I have fairly good luck with are the Taiwan, the TW and the Italy.

Braddlee: Here's the Italy. In my experience, I love this program. And as I understand, it's not a failing of this program, but *Archie* servers are generally very loaded, so it's hard to get into them. And, also apparently there's some low level protocol problem with *Archie* servers where they don't always wake up when *Anarchie* tries to go in there and get the information.

Kevin Savetz: Oh, really.

Braddlee: Peter Lewis explained it to me once, it went right over my head.

Kevin Savetz: Okay, so it's the *Archie* client [that] knocks on the door of the server and...

Braddlee: And, the server...

Kevin Savetz: ... says nobody home.

Braddlee: Right, even if it is up. So sometimes you try to use *Anarchie* to do *Archie* and it just doesn't work — that's life on the Internet sometimes.

Kevin Savetz: Hey.

Braddlee: Hey, we're getting one. So we're talking all the way to Italy. And, Italy will talk to us. Is there a question back there?

M: [inaudible]

Kevin Savetz: Okay. They're built right into the *Anarchie* client. So, what you can do is... From *Archie* it has a list of all the living and breathing *Archie* sites.

M: What about *Archie*'s comic book friends.

Kevin Savetz: Well, *Veronica*. I'll talk about *Veronica*. *Veronica* actually is something that was developed by a friend of mine, Steven Foster, [at the] University of Nevada. *Veronica* is a tool for searching across *Gopher* sites, in a similar way to the way that *Archie* searches across FTP sites. You'll see programs similar to this when we look at the WorldWide Web — for example InfoSeek and Lycos and these kinds of tools for searching for WorldWide Web information.

Veronica is a companion to that. *Veronica* has... *Veronica* and *Archie* suffer from some similar problems in the sense that they are over-used and underfunded.

As far as I am aware of, all of the *Archie* servers that are out there are run as free services. Nobody's getting paid for doing them, very much in the same way that *Veronica* — we don't have any underwriting — no commercial funding is supporting *Veronica*. This means that unlike InfoSeek and some of these other tools that are getting commercial money behind them — they don't get a strong support.

Something I think probably we should have talked about in the beginning is, if at any point — our goals is not necessarily to cover a whole bunch of applications, but for you to have an understanding of those applications as we go through them — if you feel we are talking over your head, there are not stupid questions. This is an introductory session. If there is something that we are assuming [as far as] knowledge that you don't have, please feel free to stick up your hand and interrupt us and ask for an explanation.

M: Well, when you logged in with *Anarchie*, what did you type in for path? Did you hit the dialogue...

Kevin Savetz: I've done two things. When I did the initial FTP, when I brought up this menu here, I put in the machine name — the one used was mirrors.aol.com, because that was the one that I wanted to go to.

M: How did know that was there?

Kevin Savetz: Because I've been there before, honestly. But this might have been an FTP site that a friend gave me or that I got in Internet Life Magazine or it's... and if you don't know the FTP site, then you start with the *Archie*. You start searching with *Archie*.

Braddlee: Right.

Kevin Savetz: So, if you don't know where to go, you search. But, if you do, you can go straight there. And specifically to your question: if you don't know the path, it puts you in the root directory — it puts you in the starting place. I happen to know that I wanted to go to a certain place, so I put in pub.info.mac because I knew that's what the directory was called. In the user name field, if you have an account on the computer, you can put in your user name and your password, and if you don't you can leave these blank, and it will anonymous FTP you into the site.

And then the second thing I did was when I did the *Archie* search, I just told it what server I wanted and what I wanted to search for. And, we had a bit of a problem waiting for it, but when it finally came up, it presented this list of pretty much every file that *Archie* knows about that's available by FTP which has the word "disinfectant" in the name.

And, basically, this looks like a FTP list, but if you look over in this column you can see that you've got France and Sweden and Italy and the United States. There's copies of *Disinfectant* scattered everywhere. And, if you look, you can see that we've got *Disinfectant* version 3.4 and version 3.5 and some other files that aren't *Disinfectant*, but have the word "disinfectant" in the file name. So, we decided on the University of Michigan, which is relatively close — as opposed to getting it from France. And then we can download it. It will try to go out there and get the program for us.

Braddlee: And the links in here are only going to be as good as the information on the *Archie* server. So if, for example, since the last time *Archie* went out and talked to a particular FTP site, the system administrator has moved a file, then you'll get a broken connection. It will just say, "Sorry we could not find that file."

Kevin Savetz: See, how well I demonstrated that for you?

Braddlee: Thank you, no such file or directory, yes, exactly.

Kevin Savetz: And, then you can just try to get it from somewhere else. Or, if the server is just too loaded it says come back later, you can just hit the retry button and it will try to get the file again.

Braddlee: Do you want to show people what FTP looks like coming from a Mac? Or do we want to do that later?

Kevin Savetz: Let's do it later, I think. So, in brief, that is *Anarchie*. And, I don't want to spend a whole lot of time on it, [but] take a look at *SnapSure*, which is a commercial product — which is another FTP client. The best thing about *SnapSure* is that it's interface is almost completely Mac-like — it's almost like still being in the finder. I'm going to hide others here to show you what it's like.

We're going to open a connection: mirrors.aol.com. Now, it's going to bring up a window that... it's easy to forget that you're at an FTP site and you just think that you're in the finder doing your normal Macintosh thing, but after it gets it's information... we'll wait patiently... it will present some folders which look just like the finder. And if you want to navigate the finder, you just double-click on it, and when you want to get a piece of software, you just drag it to your hard disk — just drag it right over, and it will just copy it over!

Braddlee: Now, this is shareware, correct?

Kevin Savetz: This is a commercial application. It is by Software Ventures. I think it's about \$50.

Braddlee: Making it probably the most expensive server software that you will see today.

Kevin Savetz: Yeah, the most expensive server software that you will see today.

M: Does it support "puts" as well as "gets".

Kevin Savetz: Yes, it does. If you want to put something — a folder or a single file — you can just drag it right onto your snatcher window and it will put it in that directory. So, that's kind of nice. And apparently, *Snatcher* does not want to be demonstrated today. It's just whining about something. It got in, but anyway. I wasn't going to spend much time on that anyway.

Braddlee: Okay.

Kevin Savetz: So, in brief, those are the three major FTP clients. A little bit later, we'll talk about servers including an FTP server for the Macintosh. Any questions at this point? Anything at all, anyone? Anyone? Okay. I suppose next up is e-mail?

Braddlee: Yeah.

Kevin Savetz: When we did this six months ago, I announced that the only e-mail that you would ever need for the Macintosh — that was viable, that anyone would want to use — was *Eudora*. *Eudora* is still a great program, but now there are two other decent programs that are worth mentioning. So, we'll talk about all three of them. *Eudora* is still my personal favorite, but the other ones do have some, some great benefits that *Eudora* doesn't have. *Eudora* is a program from a company called Qualcomm, and *Eudora* comes in two versions. There's a freeware version which is very functional and pretty darn useful, and there is also a commercial version called *Eudora Pro*, that comes with... I don't know what it costs, \$100 or so?

Braddlee: \$69. I think it's well under a hundred.

Kevin Savetz: Less than a \$100, probably about \$69, and it comes with Internet access. If you don't have any, you'll be able to send e-mail via their mail server. It also has some extra features: some filtering features and some other sorts of tools. I am going to be showing you *Eudora Pro*, I think that's what this version is. So you can get an idea of what it looks like. I'll bring up my... hide others here and clean things up. They have an in-box. [I want to] show you a mail box with some mail in it — there we go. There's all our mail. Oh, I've got mail from my mom — incredible! My mom is on the Internet. So you've got your, the in-box, which is where the incoming mail is.

You can see all of these little ones with the — they're new — I haven't read them yet, and then there's the ones without the dots that I have read. There's the out-box, which is stuff that is queued to go out, but hasn't gone out yet. You can find out who sent you the message, when it was sent, the size of the message... it's, 20K, 2K, and then the subject. Also *Eudora* has the ability to let you prioritize mail, so if you're sending something that you feel is very important, you can change the priority and make it high priority or low priority.

Braddlee: Is that the little chain letter you just got?

Kevin Savetz: The chain letter I just got, it would be a very high priority message, I'm sure of how I can make money fast on the Internet. And, in order to, for instance, read a message, simply double-click on it. Here's something from some random person on the Internet. There's actually no body in this message, but that's okay. So, you know who it's from, and the subject, and date, and if you want the gory details of all the headers, you can hit the blah, blah, blah button and it'll show you all the headers that you don't normally care about. So it's nice that it kind of hides that from you. You can, of course, delete messages, forward them, reply to them. It'll let you reply to the person who sent the message or reply to everybody who received the message — a group reply. You can also redirect the message, which is kind of a unique feature which is hard to explain. It basically lets you forward a message without putting the little forward brackets that you normally see. It makes it look like the message came from somebody else. It says redirected by you, but it's basically — if somebody sent you a message that you feel should go to your associate, you can just redirect it and hand it to somebody else and get it out of your life.

To send a message — mail message, new message — it's pretty straightforward. Type in the address, the subject and a message body. *Eudora* supports signatures. Actually *Eudora Pro* supports two different signatures, so I have my normal one that says who I am, and if you want a second signature, you can change the John Hancock to use your alternative signature if you like. *Eudora* will also encode programs in various ways. If you're sending an attachment to

another Macintosh user, you might use *Bihex*, but you can also use UUencoding, if you're sending something to one of those lowly PC-using vermin that you may be associated with.

Braddlee: Or UNIX system admin...

Kevin Savetz: Or UNIX System Administrator, or whatever that is. Also, I don't know why they don't call it MIME, but Apple Double is MIME, and so you can do MIME attachments. Apple Single is something apparently that is obsolete and no one ever uses, but it supports it.

Braddlee: Do you want to explain what MIME is?

Kevin Savetz: Explain what MIME is.

Braddlee: Okay. MIME is an evolving set of standards which eventually are intended to deal with multi-media Internet e-mail: so that you will be able to attach video, audio, text with fonts — what a radical concept — to your electronic mail and have it integrate seamlessly. Right now, it's fairly crude.

Basically what it does in the context of electronic mail is it allows you to attach a file in such a way that another Internet mail program — such as Pine or Elm or any of these other things that we are going to be looking at — knows in a standard way how to interpret it. One of the things that MIME does is that the Internet standards for mail don't deal with binary files — they don't deal with actual software. Anything that has Control characters, any of that sort of more elaborate stuff in it as characters in its contents.

Kevin Savetz: And God forbid, you should want to use fonts or colors or fonts of different sizes in your e-mail.

Braddlee: Right.

Kevin Savetz: I mean, absolutely unheard of, but MIME is going to let us do that.

Braddlee: Eventually, some day.

Kevin Savetz: And it's still an evolving standard, and it still doesn't work, but real soon now, you'll be able to do that.

Braddlee: And I think one of the things that's interesting too is that MIME is starting to show up in WorldWide Web stuff in a fairly frequent manner. So it's not going to be just for your e-mail, even as though it's actually a standard that was developed and intended for electronic mail. But, for the time being, if you take that copy of *Disinfectant* that we've been talking about for the last hour, if you have a copy of that that you really need to send to your friend that doesn't have the slightest idea of about how to FTP, you can attach it to *Eudora* mail — it will translate it from the binary form into ASCII text form — and your friend can bring it back down using *Eudora* and it will unhook it from the mail automatically.

Kevin Savetz: So, I've created a message, I put an attachment, I've decided I want to *Bihex* it, and I can queue the message — this is nice little feature: that if your sitting on a bus or in the airport and you want to reply to your e-mail, and you don't have an connection, just queue your messages and it'll put it in your out-box with a little Q by it and it's cute. And the next

time you log in, you can send your mail and check your mail and it will send your queued messages. (Oh, four messages...)

Braddlee: Hey, in the last hour, yes.

Kevin Savetz: ... like in the last hour. So it'll check my mail and it'll check my message, which I just sent to a test machine that's going to bounce it back to me and say, "Hey, I got it," so that we can prove that it works.

Braddlee: The little things that are flying underneath the message that's remaining to transfer, that is the *Eudora* client talking to Kevin's mail host.

Kevin Savetz: You'll hear a little beep — it said I had mail, although the sound isn't very loud.

Braddlee: *Eudora* uses what is known as the POP Protocol, Post Office Protocol, for exchanging mail. It's one of a couple of options. The nice thing about POP is that it's real solid and it works. The bad thing about POP is that it's kind of brain dead and simple, and it doesn't allow you a whole lot of flexibility about where you keep your mail or how you store things.

Kevin Savetz: Right. If you keep your mail on your laptop and on your UNIX machine, but sometimes you read out at your home computer, POP isn't good at that. There's another protocol which is better at that called "I-Map," but I'm not aware of any... there's that one tool...

Braddlee: Why don't we just... I think we actually have a copy of it here, but if you're in an environment where, for example, back home in Nevada, I work statewide — I commute between Reno and Las Vegas. I also go out to a lot of the other spots in the state. *Eudora* for me is not a good tool, because I have two options, I can keep my mail in my in-box or I can have it downloaded to the computer that I'm working on — which means that I either have to carry my laptop with me everywhere I go, or my mail gets fragmented, which for me is not very satisfactory. There's another protocol other than POP called "I-Map," which is a little more sophisticated, and *Mail Drop*, which is listed on the second page of your handout is a brand new version of a mail client from Bailey University that does work with I-Map. Now, it requires that your Internet provider have I-Map support running on their mail host.

Kevin Savetz: As it is with using POP with *Eudora*, they need to have POP as well...

Braddlee: Right...

Kevin Savetz: Pretty much any good Internet provider will have these things.

Braddlee: Should have both, right. And *Mail Drop* gives you some more flexibility. It means, that, for example, for me I use UNIX mail... a program called *Pine* fairly frequently... and I store up my mail in a lot of files in folders on my UNIX account. *Mail Drop* allows me to retrieve mail from those folders, it allows me to keep or delete mail from my in-box, it allows me to file things and have all that work happen on the remote host, so I don't have to bring all of my mail down and have it on the PowerBook. If you're doing mail in one place, the only place you read your mail is in your office, POP is wonderful.

Kevin Savetz: And, therefore, *Eudora* is wonderful.

Braddlee: Well, *Eudora* is a nice program. Anyway it is a really well-designed program. If you're in a case where your reading mail at home, you're reading mail at work, you want to be able to save things in different folders, you want to have access to all of your mail, I-Map and some of you may want to take a look at *Mail Drop*. It's a new program. It looks to me from looking at some of the documentation and things they've written about it, that they are kind of at a transition point between trying to decide if they want to go with a commercial partner — somewhat the way *Eudora* was. *Eudora* was originally a shareware program and it became big business. But, it's worth looking at if that's the kind of thing that you need. And it's basically simple and pretty easy to use.

M: [inaudible]

Braddlee: The UNIX program that I use to read e-mail is called *Pine*, it stands for, “Pine is not Elm,” — *Elm* is another UNIX e-mail practice. This is UNIX's idea of a joke. And *Pine* comes from the University of Washington. It's free software. If you've had to use anything like Berkeley mail, you would give at least a hand and maybe a whole arm to switch to *Pine*.

Kevin Savetz: I'll bring it up. We're now talking about UNIX mail tools. Which, is a completely different tangent, but what the heck. But, if you have to deal with UNIX, and you have to do mail in a UNIX, *Pine* is pretty much your only choice.

Braddlee: However, I absolutely love *Elm*.

Kevin Savetz: Oh, good, we can have an argument.

Braddlee: When I'm stuck using UNIX mail, I like *Elm* a lot better. Not only because it was written by a friend of mine but it works well — they're both easy to use. Honestly, *Pine* is a little bit easier to use which is why I use *Elm*, because I prefer power to ease of use.

M: And Berkeley mail is what?

Braddlee: Berkeley is when you just type mail and you get this horrible little interface and it's all command line and it's horrible. So anyway, but we're not talking about UNIX and we don't want to frighten you away.

Kevin Savetz: That's correct.

Braddlee: Yes?

M: [Inaudible]

Kevin Savetz: It has to have an I-Map demon running. In the same way, if you're going to use *Eudora*, the remote mail host has to have a POP demon running which... and the demon for those of you who are not aware, it's basically just a small program that runs in the background of the remote computer and knows how to handle certain things.

Braddlee: Basically, your e-mail has to come from somewhere and there's a protocol that the computers agree to get your mail to you, and it's either POP or I-Map.

M: [Inaudible]

Braddlee: Yes. The I-Map and the POP are both free by the people who make *Pine*, as well as some other versions but they're out there. And you can... basically if you're a UNIX system administrator you should know where to find them, and if you're not...

Kevin Savetz: You don't have to worry about it.

Braddlee: Even if you don't know where to find them, start at the University of Washington.

Kevin Savetz: Going back to *Eudora*, remember *Eudora*? It has some other nice features including multiple mailboxes. I could stop this message and I can drop it into a mailbox called junk mail stuff I want to get to later, and then I can open my junkmail mailbox and there's a whole list of other things in here. An extra nice feature is filtering. You can set up a filter that will take mail from certain mailing lists.

Maybe you subscribe to some high volume mailing lists. It will get that information. It will look at the two line and say hey, well if this came from a certain mailing list, I don't want it in my mail in-box, shunt it to a special mailbox for your junk mail for whatever so that you can get to it later as a less high priority. Or you might have mail from your Mom your change to the priority is lower or higher depending on what your opinion is. So... and also you can change, just change the... visually change the color of a message on the screen from a certain person so it will stand out so you can ignore it or whatever.

Also Elm has nicknames also known as aliases, so if you want to send... I can never remember Braddlee's e-mail address, so I can just type in Braddlee and it will send it to him automatically. So, in brief, that is *Eudora*. A couple questions. Yes?

M: Yes. With nicknames, can you list several names?

Kevin Savetz: Yes.

M: For an address I mean, more than one name for a mailing list?

Kevin Savetz: Yes. You can set up, in *Eudora*, also in Claris e-mail, a simple mailing list. I wouldn't put hundreds of people on it, but if you want to send something to your work group in there's twenty or fifty people on it, you can just type my buddies or my work group or whatever, and send to all those people at once. If you wanted to send to a lot of people, you're better off setting up a real mailing list. Or if people want to be subscribing and unsubscribing themselves, kind of a public mailing list, I wouldn't use any simple mail program for that.

M: [Inaudible]

Kevin Savetz: Right. The shareware version of *Eudora* doesn't handle UUencode.

M: Does *Eudora Pro* does it translate this down?

Kevin Savetz: Yes.

M: Okay.

Kevin Savetz: Yeah. This question over here came up next.

M: Yes. Does this *Eudora*... does this work well for say setting up a home server at an office where there is several people that would be connected to it as far as getting e-mail and distributing?

Kevin Savetz: *Eudora* and *Eudora Pro* are good solutions for any... just sending e-mail between any group. If you just want to send to five people or any set number of people, it's a very nice way to easily reach...

M: Are people — say they access our front page by the Internet — if they had an e-mail on their first page, first they work in the opposites [inaudible].

Kevin Savetz: Oh okay. Well that's a little... basically, I think what you're talking about, is you're talking about having the Web server do the mailing?

M: Yeah.

Kevin Savetz: And then the mail would go to those people?

M: Right. Yeah.

Kevin Savetz: And so it's going to Bob at whoever.com.

M: Yeah.

Kevin Savetz: You're not going to mail to a URL — meaning that it's basically inside the Web, inside the context of the Web page, [but] there will be a link there saying... bring up a generic mail page so the person can... puts that person's e-mail address in and the Web server handles the mailing. Yeah, this would be a perfectly reasonable...

Braddlee: I'm sorry, I don't know that... how [about] if you had an alias, a nickname in *Eudora* — there's no way the Web server would know about that.

Kevin Savetz: No, no. What you would have to do is you would have to set up a mail... I'm sorry, I thought you were talking about individuals like Bob, Mary, Nancy. If you have a group of individuals, you have to set up a mail alias at a higher level.

M: You don't have to have a specific e-mail name then?

Braddlee: Right. See the way I would do it if I was running a Web server on a UNIX machine, and I wanted all comments from the world to go to Bob, Mary and Joe, I would set up an alias on the UNIX system called Web Masters or something and anyone that sent to Web Masters as whatever.doc would go to Bob, Mary and Joe. That's a function really outside of *Eudora* that's done at a different level.

Kevin Savetz: Which is easy to do in UNIX but...

Braddlee: Easy in UNIX, not so easy in the Mac. A question over here came up first.

M: [Inaudible].

Braddlee: Long messages in *Eudora* splinter into several 32K messages — I hate that. Yes.

M: There's no way to stop that?

Braddlee: No. Basically, if you get a 100K message it will break it down into one of four, two of four, three of four, four of four. Honestly, as I understand it, from sloppy programming and laziness on the part of the programmer because other programs... if you ever use the text editor *BEdit*, it will handle huge messages. But basically it means the programmer has to go out his way and they haven't done that and I wish they would.

M: [Inaudible]

Braddlee: Yeah. This is all actually on my hard drive. And if I move things around, it doesn't affect anywhere else in the world, just in my hard drive. Any more questions at this point? Yes sir?

M: Is there a *Pegasus* mail for the Mac?

Braddlee: Is there a *Pegasus* mail for the Mac? I believe there is.

Kevin Savetz: That sounds to me... is it a commercial program?

M: [Inaudible]

Kevin Savetz: That's not one I'm familiar with.

Braddlee: I've heard of it. There may be and honestly I don't know. Sorry. We'll do an *Anarchie* search at the break. Yes sir?

M: [Inaudible]

Braddlee: For an attachment, you can tell it a default encoding and I have it, I think it's been...

M: [Inaudible]

Braddlee: Some extra scale? I'll bring it up again and we'll see. There's all sorts of little icons up there that will do different things. I wasn't going to get into all of them but I'll certainly answer the question. This is if you want a return receipt, this is if you want to keep a copy of the message you're sending on your hard disk. This one is if you want it to automatically wrap words. And I don't remember what this one is off the top of my head.

M: And all the way to the left?

Braddlee: And all the way to the left: this is the priority. If you want to be high priority it gives you the things. And normal is just blank there. And here is where you change it from *Binhex* or whatever and you can change the default on that. Okay? The next program, which didn't exist until a couple of months ago is called *Claris E-mailer* which is a pretty nice e-mail program.

It's main benefit is that it can check e-mail on other systems other than the Internet. If you have it, it will check Internet e-mail, it will check CompuServe e-mail, it will check *eWorld* e-mail, and it will also check America Online e-mail. It doesn't check Delphi, Genie or any other services. Maybe they'll add that in the future. So basically, if you have accounts in more than one system, you can ask it to go in, grab your e-mail, and it all comes to one place. And, conversely, if you want to send e-mail, you can tell it, "I want you to send this via America Online or via CompuServe or via the Internet," and it will figure out how to route that information there.

I have a bunch of e-mail accounts and it's a pain checking every service everyday. And now I don't have to log... like run America Online to log in and then *eWorld* to log in. You just run *Claris E-mailer*, you pick the accounts, if you have multiple accounts on one system, you can pick the ones that you want logged in and it connects to all of them.

If, in the case of CompuServe, America Online and *eWorld*, you can connect to them via the Internet because they are actually connected by a TCP/IP which is how I'm about to connect this up and get all this mail I haven't checked in days because I've been working so hard at the show.

But if you don't have an Internet connection you can still use this program, and it will actually dial into the local America Online number, get your e-mail, log out, dial into the local CompuServe number and log out. So whether you have Internet or not, this is a nice way to check your e-mail.

You can see I have different priorities here. I have it set up so different accounts — it changes the color of the message so I can see at a glance how important the message is to me. Some of my mail I care about more than other mail.

So it logged into two accounts in America Online and got information. Now it's logging into my *eWorld* account and getting information and now it's going to log into — I don't think I asked it to, but basically it could also log into CompuServe.

Also, there's a service called *Radio Mail* which I'm not very familiar with but *Claris E-Mail* will also work with the *Radio Mail* as well.

M: Is it pager-based?

Braddlee: It's some sort of pager-based system that lets you check e-mail even if you don't have a modem. It will... works over radio instead of over the phone lines. It's a commercial service that costs big bucks I'm sure, and I don't honestly know much about it.

On *Claris E-mailer*... kind of a different feeling to it. You may like it more, you may like it less than *Eudora*. You've got your in-box, you've got your out-box, you've got your filing cabinet which is basically like having my alternate mailboxes in *Eudora*. And it has an address book as well.

A nice feature... the first time I ran *Claris E-mailer*, I wanted to set up my address book and it can import address books from other programs, so I just showed it my *eWorld* address book and my [inaudible] address book and my *Eudora* address book and it just sucked it all in — figured out what it all meant, and now I've got this very complete address book in this program as well. So the configuration time was kept low which I appreciated.

To send a message — I'll show you the interface for that. The same basic information as *Eudora* although it looks a little bit different. We'll send a test message. (I lost my crutch there for a minute.)

We can send a message to... give me an e-mail account. So we're going to send it to my AOL account, and the address is Savetz and the destination is a whole big list of destinations that it can figure out how to send to. We're going to send it to Savetz at America Online. So that's where it's going. You can also choose which service you want to use to send it. So I can send it via my Internet account or via my America Online account.

If you're shy about logging into AOL because you're over your ten free hours or whatever it is, and you don't want to log in any more, then you send it via the Internet and it will get there.

So I can take the same message and I can — I'm adding a recipient — and I can also send it to this other fellow on eWorld. And I can send that via AOL or eWorld or basically whatever. I can type my message once, I can send it, and it will log into all services as necessary, and send the same message to multiple services and it's kind of nice.

M: Did I understand correctly that *Eudora* doesn't do this?

Braddlee: *Eudora* doesn't log into things other than the Internet to check your mail. It only logs into Internet. From *Eudora* you can send to eWorld because [the] user [is] at aol.com or user@eworld.com.

M: I understand, but...

Braddlee: You can send but you can't receive mail from your other accounts. So *Claris E-mailer*'s main benefit is that it will check your mail at other places in your Internet account. Yes sir?

M: [Inaudible]

Braddlee: *Claris E-mailer* will. It's called a "schedule." And basically you can say, "At 6:00 a.m. and 6:00 p.m. Monday through Friday but not on Saturday and Sunday, I want you to log in to this and this and this and check my e-mail." If you have, I don't know, I can't keep track of CompuServe anymore, but it used to be they had prime time and not prime time, so if you wanted to wait until 3:00 a.m. to log in and check your mail it would do that. *Eudora* doesn't do that, so that is the benefit of *Claris E-mailer* that *Eudora* does not have. Also this requires that *Claris E-mailer* is running at the time that, when 3:00 a.m. comes and if you quit the program it can't check the mail for you.

Kevin Savetz: Actually, you have limited scheduling abilities with *Eudora* — you can tell it to check mail every so many minutes.

Braddlee: Right.

Kevin Savetz: But that's not very robust. You can tell *Eudora* to check mail every hundred and twenty minutes but that's really about it.

Braddlee: Right.

M: [Inaudible]

Kevin Savetz: Yes. DOS and [inaudible] does recognize those priority levels and gives at least some limited credence to them. Limited.

Braddlee: Yeah. Something that says it's junk mail, is...

Kevin Savetz: Right. Bulk.

Braddlee: There is the priority information. Lets see if there's any more important questions.

M: [Inaudible]

Braddlee: *Claris E-mail* is a commercial product. It is available from Claris. You can actually download a thirty day fully-functional demonstration — after thirty days it blows up on you because they expect you to pay for it. But yeah, you can try it out. Bet you dollars to doughnuts it's www.claris.com and you can probably find it from there.

Kevin Savetz: And the product *Claris E-mailer/index.html*. It's on page 2 of your handouts.

Braddlee: It's in your handout.

M: [Inaudible]

Braddlee: I believe it's fifty — between \$50 and \$70. I'm sorry, I don't know the exact price, but it's less than \$100 and it's reasonable for what it does.

If there's no more questions about *Claris E-mailer*, this is kind of a different mail program. This is a send-only mail program but it's cute and it's worth talking about. And I think this is a glimpse into the future of the Internet.

This is called *Video Mail*. This is a \$5 shareware program that lets you send audio or video messages attached to your e-mail. This doesn't receive mail and basically it's a very new program. It's just a little hack that lets you take your camera, such as your *Quick Cam*... you can point it at something. The lighting in here is pretty bad but you get an idea of how it will work, and you can record a message.

"Hi from Internet World." Alright, and then we save it. And it thinks about it for a minute, and it gives you a message window so you tell it who it's to. You give it a subject line.

There's not a whole lot of interface here. It's just a kind of a proof of concept and where it's going. You can also type a normal message.

What this will do is it takes that information, that beautiful message that I just created in video, it makes a *QuickTime* movie out of it and it encodes it and it sends it as an attachment using Binhex, I believe. It's a Binhex, basically a Binhex *QuickTime* movie. There's no real magic here — you could do this yourself if you had a *QuickTime* recorder and just attaching a program in *Eudora*. But this is like one little utility that does it all. So you can even preview your movie. And the audio doesn't work, so I probably hooked something up wrong. But you can see there it is.

And then we go "Message: send," and now it will send the text. It will Binhex the file and send it. And this also will do audio-only if you don't have a *Quick Cam* or you just have a microphone, you can send audio messages.

The problem with doing this? Huge files, really big files. A thirty second message will easily eat up half a megabyte, and this is these little black and white things. So if you have a T-1 connection, have ISDN and so does the person you're sending to and they don't mind, go ahead and go for it. Audio takes up about 8K a second so that's not quite as bad although the seconds do add up. A minute's worth of audio takes up a significant amount of time. So now it's sending

the message and if you went back to *Eudora* or *Claris E-mail* it would download the *QuickTime* movie and then we could see the wonderful little movie that I made.

M: This person would receive this over the Internet?

Braddlee: A person with a Windows machine would need two things. First of all, they would need the ability to unBinhex because this is a *Binhex* file that it's actually sending. The next version of *Video Mail* is going to allow you to view [UUencoded], which is something that is much easier to do on Windows. So that will be helpful. And secondly they'll need the ability to play *QuickTime* movies. So they'll need whatever extensions that are necessary in Windows.

Kevin Savetz: *QuickTime* for Windows.

Braddlee: *QuickTime* for Windows. And then they'll be able to see it.

Kevin Savetz: Lets talk a little bit about this guy for just a second.

Braddlee: Oh sure. The piece of hardware here: this is a *Quick Cam* by Connectics. If you've never seen one of these, then obviously you're not on the mailing lists that I am because I get about twelve catalogs a week that advertise this thing. Ninety-nine bucks, black and white, 16 colors, well, 16 shades of black and of gray. It's a cute little quick-and-dirty video camera that you can use for video mail and you can also use for CU-See-Me, which we'll talk about.

M: How many frames per second?

Braddlee: Not very good frames per second-wise. It's like...

Kevin Savetz: Up to fifteen.

Braddlee: Like up to fifteen if you use the smallest window. It uses a serial port as opposed to something faster like a... but the thing is it goes straight into your serial port so you don't need a dedicated video card. You slap it in there and it's quick and dirty and I'm very happy with mine.

And also, keep it away from your dog because mine thinks it's like a tennis ball. So if you see the dog eyeing the top of the computer monitor for hours, [say], "You can't have that." That would be a bad thing. She goes through tennis balls fast enough as it is.

Anyway, *Video Mail* has... it does what I just told you it will do — it has no features other than that. It won't check your mail — it's a one trick pony. Yes sir?

M: Getting back to the camera, *Quick Cam*.

Braddlee: Yeah.

M: Is there a Windows version?

Braddlee: There is — just came out with the Windows version of the *Quick Cam*, also ninety-nine bucks. It slaps in your serial port.

M: Same company?

Braddlee: Same company, Connectics. And they are about to, in the very near future, come up with a color version of the *Quick Cam* which will probably cost a couple hundred dollars. Color data takes up more space than black and white data because you can live with 16 shades of gray but you can't live with 16 colors because it ends up looking like you've got red and blue but there's no white red, so it's kind of ugly. So I have the feeling that using *Video Mail*, your file sizes are going to be even bigger if you go with the color camera.

We'll get back to the *Quick Cam* later when we play with that *CU-SeeMe*.

Actually we're supposed to go until 12:30 — lets take a short break. I think we all need to stretch a little bit and then we'll get into something next.

[Break]

Braddlee: Our next item is going to be *Gopher* and it was up. Now this is this client called *Turbo Gopher*, and I think we'll probably talk a little bit about where *Gopher* is right now in the larger context of the WorldWide Web.

The *Gopher* was the original tool that sort of took the Internet out of the land of the pocket-protector people. The nice thing about *Gopher* is that it gives you a series of hierarchical menus. In this case, *Turbo Gopher* uses folders: events, news and weather. So I can select this folder and go down and take a look at weather and earthquake information.

And what you'll see is down here we have a list of a couple of different items. Up until this point, everything we've been looking at is a list of folders. In this case we have a terminal session for the weather underground. So *Gopher* goes out and it wakes up, Telnet, and so it will talk in-between the different applications.

M: [Inaudible]

Braddlee: Okay. No data available. Lets try BOS. Moderate rain.

Kevin Savetz: Yeah?

Braddlee: Well maybe heavy rain, but moderate is fair. Press return to continue. We can go in, we can take a look at the main menu, see earthquake data. I mean what we're doing here is we've got a terminal session set up with a remote unit's host called Downwind, desktrl.humus.edu which is the Weather Underground, not the Home and Students for a Democratic Society but rather an NSF-sponsored program for providing weather-based information, primarily to K-12 students.

You can see there are a number of things here. We can take a look at the hurricane advisories, although the hurricane season is almost over. The seismology stuff is fairly good. It's a little early for ski conditions but again this isn't really a UNIX tour so we'll get out of here. X to exit.

Now in this case, you'll see this as a text icon so what it's going to do, instead of bringing up a [inaudible] section and showing us another collection of folders, it will actually go and be unable to resolve this name.

Down at the bottom, basically what that means is we probably had what is known as a dead link. *Gopher* is a very simple protocol which is kind of like POP — it's easy to implement. One of the problems with it is that... I go up here and get the attribute information, this is going to show the information that *Gopher*, both the client and what is running on this Mac and on the *Gopher* server that is providing us with information is using as the link to get to the

remote site on the Internet. And my guess is that something about this URL is broken, that it is moved or changed and that's why we can't get to that site.

So let's try something different. Let's try the recent earthquakes. It's connecting, waiting for response, receiving response and what this is, this is actually Finger information. If people are familiar with finger, Finger is a tool for just checking account information on UNIX hosts. There's also a Finger client and demon for Mac which maybe we'll look at later if there's time. But it's essentially... what's happened here is they've taken a very simple tool which is Finger, and in the Plan file which is the file that you can attach to your Finger that will allow you to displace certain information.

Usually we just do account information — the personal stuff. They've put in the recent earthquake information.

M: [Inaudible]

Braddlee: Yeah. You'll notice the *Gopher* is menu-driven which is nice. The *Gopher* came before... pretty much before anyone had ever heard of HTML or Netscape or Mosaic. So this is kind of a predecessor to the WorldWide Web. And of course this is menu-driven and the WorldWide Web is hypertext so you're not locked into the menu driven interface.

This isn't a bad way to do things by any mean, but the *Gopher* has kind of been eclipsed by the WorldWide Web. And *Turbo Gopher* and any *Gopher* client is sort of being eclipsed by Netscape or Mosaic or other Web browsers that can access *Gopher* menus within the same program. So if you can use Netscape to access a *Gopher* menu and you're already in Netscape then that's a benefit that you don't have to run *Turbo Gopher*.

And honestly, it's pretty much the same information either way.

Kevin Savetz: And if you talk to the people at the University of Minnesota who do the *Gopher* development, they have a fairly involved and quite rational set of arguments about why there's still room for *Gopher* in the context of the WorldWide Web based on the idea that there are good reasons to have hierarchical sets of information rather than necessary hypertext. There is room for this, there is room for both in the world.

I think that, even though there is some good technical arguments including the fact that *Gopher* is a much lower overhead protocol than HTTP which does the transport for the WorldWide Web, there is a lot of emotional steps going on here. There's people that are very much emotionally attracted through the *Eclipse*, and naturally the WorldWide Web, and it will be interesting to see if *Gopher* still retains a place in all of this.

Braddlee: There's another tool that the folks at Minnesota are working on in parallel with *Turbo Gopher* and that's called *Gopher VR*. And *Gopher VR* ... the idea behind it is that it will give you a visually navigable *Gopher* menu which is three dimensional — which to me seems to be a somewhat kind of contradiction with the big advantage of *Gopher* — which is that it's been easy to use.

We're not going to show you because apparently, in Kevin's PowerBook, *Gopher VR* blows up rather magnificently.

Kevin Savetz: It's still in beta, is that correct?

Braddlee: It's very, very beta.

Kevin Savetz: From what I understand it's very pretty and you can scroll around... there's these pillars of information — it sounds very nice.

Braddlee: It sounds real nice. It will run on Power Macs reasonably stable. It's dog slow. One of the nice things about *Gopher* is that traditionally it was fairly speedy. You clicked on something and you got to where you were. In *Gopher VR* you had this range of objects. It looks a little bit like Stonehenge so, for example, if we had this list of items, there would be a little Stonehenge monument for each of these items arranged in a circle. They would have different colors and different icon graphic shapes based on what kind of resource they were.

The idea being the shape, color, size are efficient ways to help you navigate to those different lengths. And what you do is you use the mouse pad to sort of zoom around. You can go up above, you can get a 3-D perspective on things.

It's nice, but I haven't really seen anything about it that gave me a sense that it brought about any great ability and usability or efficiency.

Kevin Savetz: I think that any benefit that may have been given to us by *Gopher VR* is probably going to be very readily eclipsed by VRML.

Braddlee: Yeah. And there's a question.

M: Is anybody working on that?

Braddlee: It's the University of Minnesota and it's on the URLs for both *Turbo Gopher* and *Gopher VR* are on the top of page three of your handout.

M: So was it *Gopher* that established the use of URLs?

Kevin Savetz: I don't think so.

Braddlee: No, I think URL's evolved from...

Kevin Savetz: From HTTP which is part of the Web.

Braddlee: Yeah, because at this point, this is just the clearing house for subject-oriented such and such. This certainly does have a URL but when *Gopher* originally came up, we weren't thinking of them as URLs, we were thinking of them as menu items that we could save bookmarks to so this was before the whole URL idea came around.

Kevin Savetz: And one of the things that the *Gopher* does do is it allows you to save bookmarks. You can create a custom menu of your own *Gopher* items and go back again. At this point most people probably prefer to have one set of bookmarks and if you're going to do that, you'd probably want to be doing it in Mosaic or Netscape.

Braddlee: I don't want to bash *Gopher* too much.

Kevin Savetz: No.

Braddlee: It's still useful — it's very easy to use. So I think, especially for educational use...

Kevin Savetz: Right.

Braddlee: You don't have to wait for huge graphics to download. If you click them, it's not like there's all these little hypertext things to click on. This is very easy to navigate. A lot of useful information is out there via *Gopher*.

Kevin Savetz: Yeah.

Braddlee: I don't want to malign it too badly.

M: I've had people tell me that if you do *Gopher* this way — and those are through Netscape — you're going to get to different places and sometimes different information. Is that correct?

Kevin Savetz: I wouldn't see how.

Braddlee: I wouldn't see how. The Netscape *Gopher* ... I don't know if there's a *Gopher* home pitch for Netscape, it may start you off in a different place than the home *Gopher* on University of Minnesota, but assuming you start at the same place, where you go will be the same. But if you start in different places, then you have... basically you're running races in two different directions. Basically you should be able to find the same information, the client that you're using doesn't change the actual information that you're accessing. Question back there?

M: Searching tools?

Kevin Savetz: Yeah. You want to talk about *Veronica* ?

Braddlee: Sure. I'll talk about *Veronica*, although *Veronica* is probably — if *Gopher* is under fire — *Veronica* can pretty much be described as being buried. And I say that with a considerable amount of sorrow because it's actually one of our home projects.

Kevin Savetz: I don't know where to find it honestly.

Braddlee: Oh I'm sorry. I'm in the top menu.

Kevin Savetz: Of home *Gopher* ?

Braddlee: Oh, it may not give you that... maybe because we're coming in from outside. I may have to think about this for a second.

Kevin Savetz: Okay. Well you talk and I'll walk you through it.

Braddlee: Okay. It should have a search.

Kevin Savetz: Here is it. Search office. Okay.

Braddlee: *Veronica*, which stands for, "Very Easy Rodent Oriented Netwide Index to Computerized Archives." I still have this running argument with Steven about which took longer, writing the software or coming up with the acronym.

Veronica, obviously, is kind of a takeoff on *Archie*. There is a kind of a dumb-to-down version of *Veronica* called *Jughead*. The interface that we're looking at right now is actually called Malt Shop. Yes, the lawyers have called. Yes they did work it all out. Find what? Search Gophers by pub, [inaudible] is probably the best place to start.

Kevin Savetz: What are we looking for?

Braddlee: Lets look for *Gopher VR* — probably with a space in between. This is the *Veronica* interface. That's it. You've got that box. And then it will present another... it will create a menu on the fly of any hits that it finds on the topic that we're looking for.

And this is only searching *Gopher* space however. It won't search Web sites, and so if you use InfoSeek or one of the Web's search tools, you have to use that to search Web space. Do any of those do *Veronica* searches as well?

Kevin Savetz: They don't do *Veronica* searches. What they'll do is they'll search for *Gopher* items that are referenced within HTML pages.

Braddlee: The Web search tools can also see Gophers, *Veronica* is kind of dying a slow death because it's not as broad.

Kevin Savetz: *Veronica* is dying a slow death because we haven't been able to raise funding to continue development and broaden it. And actually, slow is probably not even the right word. It's dying a very quick death.

Braddlee: A prolonged, protracted, public, painful death.

Kevin Savetz: Oh, and this is real common. I love this.

Braddlee: And this is, yes, this is your typical *Veronica* response, which means that *Veronica* processes hundreds of thousands of requests a day across those eight or ten servers that you're seeing there. Each of those servers is capable of responding to about ten simultaneous queries which means at any given moment in time there are about a total of a hundred and twenty-five different *Veronica* searches that can be done at any given moment worldwide.

Kevin Savetz: And there are what, twenty million people on the Internet?

Braddlee: Yeah, exactly. If anyone has got \$30,000 that we can get a Sparc... twenty and set some stuff up and we'd be happy to give you your own *Veronica* server and name it after you, but right now that's... yeah.

So, the other nice thing that they've done — we talked a little bit earlier about the Swiss Army Knife versus the discreet tools concept. The folks at Minnesota are working with the discreet tools concept and what they've done is, for example, we saw earlier when we hit a Telnet reference, rather than trying to do it itself, go for handing that off to NCSA Telnet. It will do that also with WAIS requests, it will hand it off to MacWAIS. If it has an HTML reference, an HTTP reference, it will hand it off to MacWeb or if you choose Netscape, it will hand it off to Netscape. So what they're really trying to say is it's like, well, you have a *Gopher* client and you'll have a WAIS client, and each of these things will be smaller, independent applications that will do their particular thing well. Netscape being a commercial company says we want to do it all for you. We want to give you the single tool.

Kevin Savetz: And which is better depends on how you work.

Braddlee: Yeah.

Kevin Savetz: If you want discreet tools, you can really customize how you work with your computer, but you've got to install more and update more information. If you want to have one piece of software that does it all and you don't want to deal with a bunch of little things, you can do that as well.

M: Could you explain again what you said a few minutes earlier about how the Web browsers treat the *Gopher* ?

Braddlee: Sure. In fact, let me... I'll launch a Web browser and you'll see, if we have a Netscape running.

Kevin Savetz: You know the *Gopher* ... scs.unr.edu.

Braddlee: So basically, we're going to bring up a *Gopher* menu here and you'll see that once it comes up, it more or less looks like it does in the other program — it looks a little more hypertext, but basically it's just a menu. And if you want more information... let's go to the place where you've gone before here. "Search all *Gophers*" is a menu that we've seen before.

M: Now if I wanted to use one of the search engines from the Netscape or another program, would it search for that key word within the *Gophers*?

Braddlee: No. What it's going to do is... see that's one of the problems right now, is that — at least it's my understanding of it — none of the Web based search tools also look at *Gopher* space except where *Gopher* references occur within HTML documents so to sort of rephrase that, if you have a Web document and it has a *Gopher* URL as part of that page, then Info Seek or Lycos will come through and grab that *Gopher* reference, but it doesn't go and poll each of the individual 6,500 *Gopher* servers that are still out there in the universe in the same way that *Veronica* does.

M: So essentially, for the future, for *Gopher* sites to survive, they need to subscribe to some Web pages?

Kevin Savetz: You mean linked from some Web base?

Braddlee: That's right. Or some sort of miracle has to happen so that *Veronica* can survive and continue to be a viable tool for indexing that and seek better.

Kevin Savetz: And frankly I don't see any good reason why Info Seek or Webcrawler or one of those tools can't also link through *Veronica* — layer on top of it. It's just something no one has done yet.

Braddlee: Right.

Kevin Savetz: If you're good at programming, please be my guest.

Braddlee: Yeah, exactly. And there's no reason you can't... I mean I'm sure Steven would be happy, and the University would be happy to license the hooks. Or frankly, people could just go and write their own.

I think one of the things that I try to emphasize with people is that a lot of folks will go to InfoSeek, they'll do a search, they'll go to Yahoo, they'll look in the subject directories, and if they don't see something in one of those two places, they assume it does not exist on the Net. And it's really important to realize that neither of those resources — as good as they are — are encyclopedic, and that you need multiple search strategies and multiple tactics to find things on the Internet.

Kevin Savetz: One day you'll be able to buy a software agent that you'll install on your Macintosh and you will say to it — hopefully just by speaking at your Macintosh — “Find me everything about such and such,” and it will search everywhere it knows and bring it to you in one little place. But that's just my dream and isn't reality. But it's probably, honestly, coming in the future. I think that's about it for *Gopher*. You want to go with low-level tools or do you want to go with Web browsers?

Braddlee: Lets go to the low-level tools.

Kevin Savetz: Okay.

Braddlee: Because I think it's important that people know how to plug in. Okay. We're going to switch gears for a moment and talk about low-level tools, the actual programs that put your Mac on the Internet. Last year we talked about those things first thing but it's not the most exciting topic and we don't want to start you off by boring you so now that you're interested, we're going to bore you a little bit.

Kevin Savetz: We started off with a big splash by showing you Telnet.

Braddlee: Yeah.

Kevin Savetz: Just quickly... I'm sorry.

Braddlee: Sure, go ahead.

Kevin Savetz: Is anybody not going to be here this afternoon? Okay, so we really do want to show... to make sure that Netscape does get into this.

Braddlee: This is what we promise, so we'll do that.

The Internet uses protocols called TCP/IP to move information around, Transmission Control Protocol/Internet Protocol. I'm not going to tell you how it works. There are some other sessions on that and it's frightening stuff anyhow. But your Macintosh needs to know how to move packets around with TCP/IP, and the program to do that is called MacTCP — it's a control panel... it's one of the few things that we're showing you today that is not freeware or shareware.

This is commercial software available from Apple Computer. If you buy it from Apple's Developer Toolkit Company, they'll charge you about \$75 for it. The better way to get it if you don't have it [because] you need it — I mean there's absolutely no way around that, is you go

out and buy the book *Internet Starter Kit* for Macintosh by Adam Engst. It's an excellent book. It's published by Heyden and beside the fact that it's a great book, it comes with a disk filled with good stuff including MacTCP. And the book is only \$35 or something like that. \$29.99 or something good. So it's less than the actual cost of the software.

M: Adam Engst?

Braddlee: Adam Engst, E-n-g-s-t.

Kevin Savetz: And maybe while we're talking about Adam, talk about the *Tidbits Newsletter* for just a second?

Braddlee: Go ahead.

M: I'm sorry. Doesn't that come with... if you were to buy a Mac tomorrow, wouldn't that come with it?

Braddlee: Yes. System 7.5 allegedly comes pre-installed with MacTCP. I haven't proven that myself, but that's what I hear.

Kevin Savetz: Yes, it does. Adam — in addition to writing *Internet for Macintosh* — has a really excellent Internet based newsletter about Macintosh stuff including a lot of focus on Macintosh Internet tools. And it's called *Tidbits*. And what we can do is...

Braddlee: It's tidbits.com.

Kevin Savetz: Right. So I was thinking about the mailer for it. Keep talking. I'll find it.

Braddlee: He has his own FTP site which is FTP tidbits.com but it is something that if you get that book or even if you don't get the book you may want to subscribe to.

Kevin Savetz: And it's a free newsletter delivered by electronic mail.

Braddlee: Yeah. And it comes just often enough to be useful and not so often that it's annoying.

Kevin Savetz: You can read it on-line or on the Web or by E-mail. The quickest way to get the information is to go to <http://tidbits.com> and then you can get information on how to subscribe to it. If you're not on the Web yet, come up here and we'll give you the e-mail address later. But if you're not on the Web yet, shame on you. Okay. Enough about *Tidbits*.

Braddlee: So we've got MacTCP which is this really geekie. There's this really geekie control panel, want to see something frightening? Basically this where you tell it all the low level information. It says hey, I want you to be on the Internet and I want you to talk.

Here is the router we're talking to, this is where we're getting domain name server information, this is our subnet mask. This is all a bunch of stuff that you can set once, your Internet provider will give you the information and hopefully it will work and you can get logged in.

And you need all of this stuff. None of it is optional. For example, the gateway address, that router, that is how we get up off the local area network after the rest of the Internet. That

is not optional. Domain name service, if you've been using a lot of addresses like tidbits.com. All of those names that we used on the Internet, that people like, are mapped across a series of number, like 134197.25.97 which is the unique numerical address of the Mac that sits on my desk in Reno which is also known as braddlee.scs.unr.edu.

Kevin Savetz: And it's a heck of a lot easier for us to remember the words than it is the numbers.

Braddlee: Right.

Kevin Savetz: So DNS, Domain Name Servers, translate the name to the numbers, something that we understand to something the computer can understand a little bit better.

Braddlee: Right, exactly. And there are things that are just not optional stuff, you've got to have them. Your net service provider, whoever manages your local network will know these things. If they don't, drop them immediately. And you basically just follow the instructions.

Kevin Savetz: Right. Follow the gateway number, into the gateway, put the domain name service and the domain name.

Braddlee: Depending on how you access. So that's MacTCP. You set it up, hopefully it works, you forget about it. Depending on how you access the Internet, you may need one or two other tools. Currently, if you're at work and you have an Internet connection, you might be on the Ethernet. This wire is basically just the Internet and plugs into my Ethernet and goes into the back of my Mac. MacTCP is all I need. I set it up correctly.

However, if you're dialing in — a lot of people access the Internet via modem, they have a 14.4 or whatever modem sitting on their desk and they're dialing into the Internet — you need one other tool. And actually there are two tools you can do it with, but you need one of them. One is MacPPP which stands for Point-to-Point Protocol. And the other one is called MacSLIP. I'll bring up PPP if I can find it — here it is.

This is another low level protocol which actually takes the TCP/IP information and translates it to PPP information so that you Mac can talk to it. It's just another low-level tool. You don't have to really understand how it works. You just have to have it for it to work.

Kevin Savetz: And this is only if you're connecting over a phone line — if you have a direct Internet connection, this doesn't apply to you.

Braddlee: Right. If you log in with a modem, this is... you probably use this program because this is actually the program with the button that you press to log in. You press the Open button and your modem dials in and gets you connected and that sort of thing. It has all sorts of configuration options, the phone number you want to dial, your modem and net string.

Kevin Savetz: What is your credit card number?

Braddlee: There is my calling card number if you need it. Your connect script with your password and all that good stuff.

Kevin Savetz: One of the things that would be nice for it to do would be to encrypt both some of these phone numbers and passwords, particularly to people who do stuff like both of us do, to travel with PowerBooks. It doesn't do that. It's a little bit of a security problem.

Braddlee: Yeah. Basically, anyone could sit down at your Mac and find out what your password is. Actually there is a way around that if you're... but usually not.

So this is just another one of the low-levels tools. You set it up once, you run it, you hit Open, it talks to MacTCP for you. It just does some of the dirty work to get you connected.

M: [Inaudible]

Braddlee: No, the MacPPP and MacSLIP are both freeware that you can download off the Internet.

Kevin Savetz: Once you've gotten your connection.

Braddlee: Once you've gotten your connection. Or you can buy that book by Adam Engst and it includes it as well.

Whether you SLIP or PPP... I'm not sure if I actually have SLIP on here. I may not. They both do the same thing — they connect you to the Internet using either the SLIP or the Point-to-Point Protocol.

The one you will use, your Internet service provider will tell you. They will say, we support PPP or we support SLIP. You don't argue with them. You set up the program and you get on with your life.

If they give you a choice, take PPP over SLIP. It's a little bit faster, a tiny bit better. But if you have SLIP, not PPP, don't worry about. You have a question back there?

M: [Inaudible]

Kevin Savetz: I don't know very many people that are actually offering just SLIP anymore.

Braddlee: No, me neither.

Kevin Savetz: Yeah. There's probably just somebody out there.

Braddlee: So anyway, those are the low-level tools and incredibly boring, so lets take any more questions and then get onto Netscape, or [inaudible]. Yes sir?

M: [Inaudible]

Braddlee: It should come with a... if you buy a fax modem, does it come with the software? Probably not. It may. There's no telling what is bundled with the modem, but the two things you need, MacPPP and MacTCP — I wouldn't count on it. And you probably need to find them from another source.

Okay. Wake up. Now we're talking about Web browsers. If you haven't heard of the WorldWide Web, the door is back there. What's that? Believe it or not, there are other Web browsers other than Netscape. There are, in fact, quite a few. And we're going to look at a couple versions of Netscape and a couple of other Web browsers.

The Web browser that made the WorldWide Web what it is, is called NCSA Mosaic. And NCSA Mosaic is a good program. Frankly though, when Netscape came out it was — Mosaic was completely eclipsed by Netscape because it's a little bit more powerful and it has some features that Mosaic doesn't have.

Kevin Savetz: And some of the history behind that is that a guy named Mark Andreessen who is at the University of Illinois and was working as basically a student programmer for the National Service for Computing Applications, the same people that did NCSA Telnet. He and some other folks wrote the original version of Mosaic, and I suppose somewhere after the first million copies of Mosaic went out the door, he probably wondered why he was making \$8 an hour.

He joined forces with Jim Clark who was the former CEO of Silicon Graphics, the high-end workstation people that do the computers that get used for things like *Jurassic Park*. Then they formed Netscape as a company and rewrote Mosaic from the ground up with more people, more money and basically they pretty much whooshed by Mosaic at this point.

Braddlee: So this is NCSA Mosaic. This is the most recent version, version 2.something.something else.

And we're going to... you're going to be able to see that no matter which browser or client you're using, it's still the Web. You've got something you can click on, which is usually blue underlined but not necessarily.

You've got your graphics, and you can scroll around and look at the absolutely... (it's still getting the information). And if you want more information about something, it's hypertexted — you can click on it and it will bring up another page.

Mosaic... I'm groaning at it — Mosaic feels slower than Netscape. Honestly, I use Netscape everyday. Mosaic hasn't, as I said, hasn't quite kept up the pace with Netscape. It's a little bit slower. You load a page and it takes a little bit longer for all the graphics and everything to come up. However, it's still a pretty popular browser and they're still actively working on it. And by no means have they given up the race. I think it's still a viable browser, although not my personal favorite.

And something else, too, to keep in mind is NCSA's Mosaic is free for anybody — whether you're commercial, governmental or educational. There are some restrictions on the Netscape free license.

Kevin Savetz: Right. Netscape is a commercial product that you can buy for about \$50. There is a free version available, however, the license agreement says that it's only available for educational and non-personal use for thirty days. Nobody ever does that. Everyone just downloads it and uses it forever, but we are not condoning this activity and it is a product that should be paid for if you're going to use it — even though nobody ever does. Although if you pay for it, you get support.

Braddlee: If you pay for it and you're having trouble with it, you can call up and whine. Calling NCSA and whining about Mosaic will not get you very far. Yeah?

M: What's the difference between NCSA Mosaic and [inaudible].

Braddlee: What happens is NCSA has licensed the original source code for Mosaic to a number of companies, I think Quarterdeck and Spry and a couple... there's not a unique license for it, a number of companies have purchased that. What they've done is they've gone in and they've

rewritten the Mosaic code to make it faster, to make it support more extensions, to do a number of things. Since our focus has primarily been on the free or shareware tools, we're not going to go... there are a bunch of different enhanced MosaiCs.

Kevin Savetz: I'll bring up one of them I happen to have here.

Braddlee: Great, good.

Kevin Savetz: Sometimes you'll buy a book and it will come bundled with an enhanced Mosaic. O'Reilly and Associates has a book called *Cruising the Web with Macintosh* or *Surfing the Web with Macintosh* or something like that. And it comes bundled with this particular version of enhanced Mosaic. In its heart, it's still NCSA Mosaic but they sped it up a little bit, they added some features and kind of made it a little bit spiffier.

Braddlee: You get a different home page.

Kevin Savetz: Yeah, a different home page. I'm trying to bring up another, so you can see — it's still the Web. And you can't get enhanced Mosaic without paying for it. Generally it involves buying a book or some other product that comes with it.

Braddlee: One of the things about Netscape that has sort of helped to keep it out in front is that Netscape has been fairly aggressive about developing new extensions to the HTML standards — Net things that the people who are doing Web page development like and grab onto and use fairly quickly even though they're not necessarily ratified standards. And this kind of puts the folks who are doing other Web browsers into a difficult position because Netscape will go out and promulgate something and they have to wait until their next release version to incorporate it into their browser. So they're always — almost by definition — one step behind some of the stuff that Netscape is doing because Netscape dominates so much of the market. They're kind of getting to [be] defacto a lot of the standards.

Kevin Savetz: I'd like to give an example of that.

Braddlee: Good.

Kevin Savetz: We're going to bring up a page in Netscape which is Netscape enhanced for your pleasure, and while that's working I'm going to bring up the same page in Enhanced NCSA Mosaic. Open URL, all right. And it used to be things as basic as centering wouldn't work. And now, I mean tables where you have raised tables, and a number of other things are just and the frames that are coming out.

Braddlee: Here is a Web page from my Internet service provider. This is like that, what is different between these two pictures came. So notice Internet, and you can see the text, there's some bold and there's some links and, okay, fairly plain, certainly readable.

Here's Netscape's version. Same information, same Web page, same HTML code. We've got the green background, we've got the funky... the great, huge text with the huge letters. And frankly, it's just a lot more appealing. It's a lot prettier to look at. But it's the same information and frankly, eventually I'm sure the other MosaiCs will catch up.

But Netscape, although it does a fine job, is kind of... leads the pack because it makes up its own rules and waits for a stamp of approval later.

M: I read that they have formally announced that they are going to start going through the proper channels.

Braddlee: Well, they kind of always, sort of have done. I mean what they do is they go in and propose it as a standard and they incorporate it in their browser. And there's absolutely nothing wrong with that. That's perfectly fair and legitimate and no one is saying that anyone has to use those codes. But what is happening is that out in the marketplace, the codes that they're developing are the things that people want to use. They're responding to the market need and the standards aren't really keeping up.

No, everything that they do is open. And everything that they're doing fits in. I don't want to propose... say that they're doing anything unfair. They're not. They're just being...

Kevin Savetz: They're being aggressive.

Braddlee: Yeah. They're aggressively trying to move things forward because they care about it as a medium. And also it's in their self-interest to a certain extent.

If somebody else had 60% of the market share, they could also help define standards in the same way. It will be interesting to see how this plays out, whether it ends up in the long term being a healthy thing or whether we're making a marriage now that we will regret later.

So we're in Netscape so we might as well talk about Netscape now. I mean not that we haven't been.

As I said, Netscape is a commercial program, about fifty bucks, you can get it for free if you're an educational or as a trial basis.

The current version is 2.0. It's still in Beta. If you're scared of Beta products, you can use version 1.1. 2.0 is allegedly adding some features that... some of which are available for the Windows Netscape but not on the Macintosh as is so often the case, we need to wait a little bit longer than Windows users.

Netscape will allow... have an interface for Java which we'll talk about in the second half, as well as adding an enhanced e-mail program so if you want to send e-mail from Netscape in one place you can do that as well as some additional HTML tags and some other things.

Kevin Savetz: Yeah. Right. An allegedly enhanced news reader.

Braddlee: On the Beta version of this, Kevin says he has been running this quite happily in his PowerBook for the last week or two. It just came out quite recently.

When I installed this in my PowerBook, it blew up. I've looked at it a number of different ways, installed it. There is a thing called [Defrost] which is out which is a freeware patch to address some MacTCP problems that Netscape 2.0 B-1 is having.

I've found some things that are broken in the news reader and in the mail, even when I use it on my desktop Mac so my call on this would be that this Beta version is still pretty Beta. And if you're adventurous and you like to be out on the edge and see things that are going on, great, go for it. But don't throw away your copy of 1.1 which is a stable release version.

M: Can you leave them both on the machine simultaneously?

Kevin Savetz: Yes. You can leave them both on the machine simultaneously but you can't run them both simultaneously. Frankly, the coolest new thing in Netscape which is supposed to be Java isn't there yet, so I don't know, download if you want to but don't expect...

M: [Inaudible]

Kevin Savetz: No, it should not. Back there?

M: [Inaudible]

Kevin Savetz: I'm sorry?

M: [Inaudible]

Kevin Savetz: Right. I don't know anything about *Open Transport*.

Braddlee: I guess what I know about *Open Transport* is that *Open Transport* is out. It certainly does all the functions the MacTCP does. The problem is that there have been a number of problems with it working with existing Internet applications.

For example, CU-SeeMe does not work with open transport. A number of other things won't work with open transport. There was Guy Kawasaki's list just announced day before yesterday that there was an interim release of *Open Transport* to address some of those problems, what they described as the most critical.

I'm kind of waiting on *Open Transport* until the next real release version or when my 8500 comes in and I will probably start running it on my 8500. I'm back ordered until like the next solstice. So I assume that by the time the 8500 arrives, that new version of *Open Transport* will arrive and I'll get them both about the same time and then I'll start digging into it.

M: [Inaudible]

Braddlee: Right. I would... if it was today, if it was my Mac and I didn't have the job that I have, I would stick with MacTCP. Because of the job that I have, I would use the *Open Transport* but I have a feeling I would be spending a lot of time swearing at it.

I've talked to folks that are having to support it and they're not real happy about it. I think it's going to be a really good product when it's finished. But it's [not] being released, it's not a finished product.

And to be fair, the earliest versions of MacTCP had some pretty ugly things about them too. So, it's interesting but I don't think it's quite ready for prime time. I saw another question back there?

M: [Inaudible]

Braddlee: Okay. I don't know what else there is to say about Netscape.

Kevin Savetz: Show the mail?

Braddlee: Oh sure. I can actually... we can't show news actually which is [interesting].

Kevin Savetz: Well actually, hold on, we might go talk to the server over at Netscape. Yes?

M: [Inaudible]

Braddlee: All right. One of the things about the Netscape browser that I don't believe is true about Mosaic, and Kevin correct me if I'm lying to you, is that when Netscape was built it was really designed as being a commercial tool. At the point it came out, everybody had already kind of caught on to the fact that having hypermedia and having multimedia on the Internet, as a network environment was a big tool for marketers and for distribution of information.

So security has been built into Netscape in a number of levels, both at the level of being able to see, for example, the broken key down at the bottom left hand side of the screen indicates that you're not talking to a secure server meaning that you can't be absolutely positively certain that the server that you're talking to is the server it is purporting to be.

Also Netscape supports the secure transactions. And there have been a couple of concerns about that, one of which is some guys at Berkeley had found a back door to break some of the security features. That resulted in the release of the 1.12 version of Netscape and a lot of, sort of, hooray, that's a very minor bug.

The other thing which is probably more interesting is a guy in France recently broke the 40-bit export version of the Netscape transaction keys. What that means is there are... the U.S. right now has some, and we'll talk about this a little bit this afternoon, has some significant issues about the licensing and exporting of encryption software for secure interactions.

The export software, if I recall correctly, is limited to a 40-bit key length which is breakable. A gentleman in France recently proved that by lining up a super computer and about eight other toys and spending a week or two breaking a single Netscape key, a 40-bit single Netscape session key.

So, in other words, it took more than half a dozen computers more than a week to break what would be the equivalent of a single credit card. So it's not very practical but it can be done with the very small key lengths that people are restricted to exporting.

And within the United States, the key length is 128 bits and that's significantly more secure but it really is... it's a policy question, it's a commercial question., there is some real issues about doing international business using these sorts of tools right now.

Kevin Savetz: This is what happens when you request a secure document, is it okay? You'll notice that the key here is not locked. Actually now, this is Wells Fargo, my bank. You can go in there and see that this service lets you find out what your checking balance is, whether check number 1234 has cleared, but, you don't want those packets going unencrypted on the Internet, so this is encrypted and I can feel relatively secure that casual snoops won't be able to find out that I'm broke.

Braddlee: Or even fairly dedicated snoops at this point.

Kevin Savetz: Yeah right. Yes sir?

M: [Inaudible]

Braddlee: Yes. Well the server... Netscape uses both of the two different users.

Kevin Savetz: It uses SSL and SHTTP.

Braddlee: There are two different ways to be secure, to do secure HTTP. One is called Secure Sockets Layer or SSL and the other is called Secure HTTP, two different protocols for doing about the same thing.

A Netscape client can handle both of them. Allegedly anyone can write a server, a Web server, which can use those protocols. The biggie though, the one that everybody uses, the one that a lot of people trust is Netscape server which is a \$5,000 piece of software called Netscape, Server which you can use to move secure information.

Alleged... theoretically any browser can have these functions and any server can have these secure functions, although there aren't a whole lot of them for the Mac at this point.

Kevin Savetz: The MacWeb supports SHTTP. It doesn't support SSL. Netscape supports both of them. As far as Web, MacWeb servers, the Web Star Server which is the commercial version of MacHTTP is going to, by next spring, support both [inaudible] and SHTTP, at least from what I understood from talking to them the other day. Yeah?

M: [Inaudible]

Braddlee: It's actually a separate Web server, for instance, that Wells Fargo is running. They actually have two Web servers. They have the not encrypted one, the not secure one and then they have the secure one. And anything that runs on the port of that secure server is by default secure.

So basically, they have a separate machine and whenever anything goes to that machine it is secure. It's not like a [inaudible].

M: Well if you wanted to make a document secure, you have to basically [inaudible]?

Braddlee: Yes. That is correct because your system needs to be running a server which does security which generally costs bucks and ISP, servers who purchase that are probably going to keep that so that you have to pay them a little extra because it's an expensive product, the software.

Okay.

M: [Inaudible]

Braddlee: Yes. There is another Web browser which is called... which you briefly mentioned called MacWeb. As far as I know, it hasn't been updated in ages.

Kevin Savetz: Ages. Meaning at least ten or twelve months.

Braddlee: Yeah. No. It hasn't been updated in a long time and frankly it's... I will load it up just so that you can say that you've seen it, but it is out of date. Version 1.0 Alpha 3 came out like a year ago, and it's not been updated. The program didn't stay with the times. There are better programs for browsing the Web.

The benefit of this program, really the best one, is that it's a very small program and if you're limited on memory, MacWeb actually does an okay job. But you're not going to get the pretty Netscape enhanced graphics or anything. But it fits into a small memory space if you're tight.

Kevin Savetz: The lost generation of Web browsers.

M: Does *Lynx* run on Mac?

Braddlee: No. *Lynx* is a text-only Web browser mainly for UNIX if you don't have a graphical interface. And there is no version of *Lynx* for the Mac, which is really, I don't think, any major loss.

M: It is for people who can't see.

Braddlee: For people who can't see, you can log into... basically log into a UNIX system and use *Lynx* from there.

Kevin Savetz: And the screen readers you were talking about visually impaired folks who need readers. Yes. No that's...

M: It's a major loss.

Braddlee: There are utilities that will work with screen readers for the Macintosh which will work with any program, so you could use Netscape and a screen reader or whatever.

M: What's the statistical breakdown? Everybody says 80%, 75% to 80% of people use Netscape.

Braddlee: That's what I hear.

M: What about the other 20%? Have you read the most recent statistics?

Braddlee: Well I have a feeling that they're scattered among the other, whatever is left. It used to be there was Netscape and then NCSA Mosaic and then 1% was everything else. But I think right now, the other 20 to 25% is everything else.

Kevin Savetz: I guess AOL.

Braddlee: The AOL Web browser, right.

Kevin Savetz: It's used by a lot of people. And then there are other things.

M: I heard there was a pretty large, there's a surprisingly large number of people still using *Lynx*?

Braddlee: Well sure. I mean, for example, in our environment, in higher education, we're in the process... we were just getting to the point where we're able to offer PPP and dial-up Internet connections to our students. Some of these cost a half million dollars to bring about. So those students currently have regular analog dial-up connections and they use Pine, the UNIX program for e-mail. They use the UNIX version of *Gopher*, they use Ten, the UNIX news reader and they use *Lynx* to do their WorldWide Web access.

Kevin Savetz: Here's what the Web looks like if you're using *Lynx*. Same information, less pretty, but it does the job.

Braddlee: And yeah. And *Lynx* has continued... *Lynx* actually is keeping up. *Lynx* does tables, *Lynx* does forms, there they're making an effort to keep *Lynx* current with the standards.

M: [Inaudible]

Braddlee: Most of those will work in *Lynx*. They're behind but they're trying to keep up. I'm trying to think of something that would be...

Kevin Savetz: I'm bringing up that North Coast Internet page again. While that's loading up, we'll take a question over here.

M: [Inaudible]

Kevin Savetz: Interesting.

Braddlee: In 2.0 or 1.2?

M: [Inaudible]

Braddlee: I almost never have to turn off graphics, I have to admit. I did it last night and it was almost painful.

M: [Inaudible]

Braddlee: Yeah, it is. I don't know. Honestly, I don't know the answer to that.

Kevin Savetz: Here's the same Web page in *Lynx*. This doesn't have any tables on it. Off the top of my head, I can't think of any pages with tables but it's not centering the stuff, but other than that, it's handling it relatively well I guess.

M: What if they gave you a second table?

Kevin Savetz: Hey, I'll try anything once.

We're going to start wrapping up. It's time for the break.

Braddlee: While you're looking, I'll talk about something else. Helper applications.

Netscape does a lot of things on its own but it doesn't do everything. A lot of pages are now being enhanced with sound, they're being enhanced with video clips, they're being enhanced with other neat multimedia things. One of the things you'll still need [inaudible] supporting more and more are those things internally is you'll want a selection of helper applications.

QuickTime comes with the Mac. You'll want that. That will be a *QuickTime* video player. There is JPEG View, JPEG images at a higher, clearer resolution than Netscape's internal GIF and JPEG tools.

Another net thing that it should have would be *Reel Audio*. I don't know if we've got *Reel Audio* at this show. *Reel Audio* allows you to have not streaming video, not live video... I'm sorry, not live audio but rather stored audio that can then be downloaded. But the neat thing about *Reel Audio* is it allows you to play it back right after you've clicked on the link rather than having to wait for the whole audio file to download.

The compromise in that is that the audio quality is bordering on tragic but if you like AM radio from the 60's you'll really love the fidelity of *Reel Audio*. But again, it's kind of a proof of

concept, they're taking it forward. I was talking to them and their next version is going to support 16-bit audio which is sort of near-CD quality sound.

Kevin Savetz: If you have the bandwidth to support it.

Braddlee: If you've got a bandwidth to support it. It will require that... right now *Reel Audio* requires 14.4K connection. The new version will require 28.8 connection, minimum, to work, to get your performance.

Kevin Savetz: We brought up a form, this is at L.L. Bean using *Lynx*. So it's a reasonable form. You can fill it out. It works in Netscape, it works in *Lynx*. It slices, it dices. That's it. Yeah?

M: [Inaudible]

Braddlee: *eWorld* is the on-line service, you mean? *eWorld* is an on-line service, like America Online. It is... it has a Web browser so basically if you don't have any other Internet connection, you can use *eWorld* or America Online to access the Internet with their Web browser.

Unfortunately, you cannot use any other browser so if you don't like theirs, you can't use Netscape instead. You're stuck. But it's a good way to access the Internet if you don't have a local ISP, if you're out in the boonies or something like that.

I'll bring up *eWorld* just so you can see it?

M: [Inaudible]

Braddlee: I don't believe so. I have used AOL's browser which is... you didn't hear this from me, but it's crap. They're coming out with a new version next year. It will be better, yadda, yadda, yadda.

I have not used the *eWorld* browser myself.

M: [Inaudible]

Braddlee: If you're using AOL or *eWorld*, you cannot use any other browsers other than theirs, on the Macintosh.

M: [Inaudible]

Braddlee: Only for Windows. Windows users can. Macintosh users cannot. And it's not easy, but it's doable.

M: [Inaudible]

Braddlee: About Microsoft *Word* being a browser... I heard about that. I heard Microsoft *Word* is going to be a browser and... as well as being a word processor. And also I heard about some other product, oh Quicken is going to have a browser in it.

I don't know why. I think it's stupid. I think Microsoft *Word* should be the best damned word processor that Microsoft can make it and Quicken should be the best darned financial program there is and I don't need fifteen Web browsers, but I'm going to have them.

I think [its time for a break.]

[Break]

Braddlee: ... such as Telnet, FTP Tools, and Web browsers and also some of the low level tools like MacTCP and MacPPP.

In this part, we're going to look at some of the fun stuff, the cutting edge multimedia toys such as audio conferencing applications, video conferencing application and other goodies.

A lot of this stuff is really on the cutting edge. We're going to be showing you a lot of Beta software, software that is still under development. It could crash on you.

Kevin Savetz: I think it's probably fairly comfortable saying at least something will... at least one thing will crash.

Braddlee: Yeah. In the next two and a half hours, we'll get something to crash for you.

Kevin Savetz: So we can start a pool on when the first crash will happen if you want to take bets we'll handle that for you. I am from Reno. We know how to do these things.

Braddlee: A lot of this stuff is cutting edge. It's new, it's in Beta, so if you're scared of Beta software you might not want to try some of this stuff.

Also, a couple of times during the next two and half hours we're going to say, not here yet, real soon now. And that's sort of life on the cutting edge and also life with a Macintosh because if something is going to be cutting edge sometimes they develop it for Windows first and import it to the Mac, and that means we have to wait.

Kevin Savetz: Although some of the things we're going to see are Mac only.

Braddlee: That's true. We are going to start with audio conferencing applications which is a relatively new thing. There was no, there was really no... hardly any talk about this at the last Internet World six months ago. There was one program for the Mac called *Maven* which was buggy and crashed a lot. Now there is *Maven* which is currently today buggy and crashes a little.

And there are actually two or three other programs for audio conferencing on the Mac. It used to be you were talking to people on the Internet involved bringing up a talk window and typing, chatting "Hi, how are you?" And they would say "I am fine." And it was just text on the screen.

Internet tools have progressed very rapidly towards multimedia, and now if you want to, you can use a variety of programs to actually have a microphone, have a speaker on your Mac and say "Hi, how are you." And the person can hear you in more or less real time, hear your voice, and you can speak to one another. And there are a variety of programs for doing that.

Kevin Savetz: And one of the nice things about doing this on the Mac platform is that Mac has full duplex audio built in.

Braddlee: Most Mac models have that. Most Macs. True. If you bought it in the last year and a half to two years, with the exception of a couple of PowerBooks, they have full duplex audio.

Kevin Savetz: Which means you can talk and listen at the same time, much like on the phone.

Braddlee: Right. And that the support for multimedia is much better. Things tend to run better and if you guys are... any of you guys have to do multimedia on your Windows, installing, configuring cards, getting things to work, getting things to play nice with each other, is a lot more trouble.

I mean what we're doing here, I wouldn't even want to think about trying to do a live demo with as many different applications as we were bringing in today. Where we kind of like schlepped a lot of them over... some of them over from my hard drive to Kevin's hard drive and just kind of put it all together. *NetPhone* ?

Kevin Savetz: I was... do you have a *Maven* reflector that we can use?

Braddlee: No, I don't know.

Kevin Savetz: So have you seen any reflector that... ?

Braddlee: Yeah. We can point to.

Kevin Savetz: You do that and I'll explain.

Braddlee: Okay.

Kevin Savetz: The first one we're going to work is called *Maven*. It's been out the longest. *Maven* is freeware and it's a program that will let you chat with other people in real time. It lacks some of the nifty features of *NetPhone* and *PGP Phone*. We'll show you what those are. But this is a basic, relatively stable audio conferencing program so you can meet up with other people and chat with them.

If you're looking to chat with a specific person, who is also running *Maven*, you can... and you know the IP address of their Macintosh, you can type it in and assuming that they have *Maven* running, you can chat with them in real time.

Maven also is compatible with some other applications. It's really one of the most cross-platform-compatible audio conferencing applications that there are which means that if you want to talk to someone who doesn't have *Maven* but they have *CU-SeeMe* which we'll look at in a little while, you can talk with *CU-SeeMe* and if someone has *NetPhone* this will talk platform the *NetPhone* as well.

It should also talk to *CU-SeeMe* on Windows although the last I heard, the Windows version of *CU-SeeMe* could play audio but could not encode audio, so as soon as it does you'll be able to actually have a cross-platform-conversation with your Windows loser buddies that you may have.

Kevin Savetz: Nobody home so far.

Braddlee: Nobody home so far.

Maven... what we're trying to do now is connect to a reflector which is a place, a public server, where people can connect basically to chat with strangers. It's like a pub. You can go into a bar and then find someone interesting to talk to.

In *NetPhone* it's called a net pub. In *Maven*, in *CU-SeeMe*, it's called a reflector. And getting into reflectors can be a dubious proposition so we're trying to do that now.

Maven's primary disadvantage... actually I could think of two. One is that it crashes a little bit more than *NetPhone*. And number two is that it requires kind of a lot of bandwidth.

NetPhone will work under 14.4 kilobits per second so if you have a modem at home you can use *NetPhone* to do audio conferencing.

Maven works a lot better with 28.8, with 14.4 it sounds like that. And that's not very useful. It's fun to play with but not useful for getting work done. At 28.8 *Maven* does a lot better.

M: Where do you pull it down from?

Braddlee: We have... you didn't get it, but we have a handout which lists where to get everything that we've talked about. And you are offered that which I will give you right away.

M: [Inaudible]

Braddlee: Have you ever used *Maven* from behind a firewall, a proxy or... I think that would be real dubious because I'm not sure what port. The thing about this is you'd have to have it... it's going to use a specific port, and to be honest, I don't know what the port number is for that. So what you'd have to do is you'd have to have the firewall administrator open up that port, and firewall administrators don't usually like to open up ports without some sort of compelling [reason] why.

Kevin Savetz: I want to play with *Maven*.

Braddlee: Right. I just want to get this out of the way. For those of you who do not have the handout, this is the URL where you can get the handout. It's not there now. It will be there by this weekend.

Kevin Savetz: And we apologize. There should have been enough handouts for like two for every person that's been here. So either somebody went home real happy...

Braddlee: Or there's more of you than we expected or something.

Kevin Savetz: Yeah.

Braddlee: Let me see if I can get this to wrap. Here we go. Okay.

That should all be in one line. That's the URL where you will find... that's the one we're telling people, right?

Kevin Savetz: That's it. That's what we're telling people.

Braddlee: We're going to try to keep this reasonably updated as new versions come out, so you might just want to make a bookmark and then later on when you want to try *Maven* or *NetPhone* you should be able to find it relatively easily. We're not demonstrating *Maven*.

Kevin Savetz: We've got a connection to Nisernet but I don't hear anything.

Braddlee: Okay. I'd like to try to get this out of the way [if] we can, it's a broken little... All right. We're probably not going to be able to actually demonstrate this product, but you can see that this is the main *Maven* window. There is... you can press the button and you can speak into it and if we were connected somewhere, it would transmit my voice in real time.

Although we can't demonstrate this program, we'll show you *NetPhone* and it's reasonably the same, although like I said, *Maven* really wants a faster connection to work properly. You can turn off and on the other person if you want to temporarily turn off your speaker.

To connect to a place, you hit "add user" and then you type in the address of the site that you want to connect to. And this can either be an individual person for a one on one conversation or it can be a reflector for a group conversation.

Some reflectors are public and when you get there, you're just going to find people chatting up a storm about who knows what. Some are private and some businesses have private reflectors for people actually trying to do serious work.

The upshot of this and *NetPhone* and [*Maven*] is it can work... when the Internet connection is right and assuming that you and the person you're talking to have a fast enough modem, this can work as a viable alternative to picking up the phone and dialing long distance.

But you need to try it once or twice to see... get a feeling for your application and how it's going to work. I've talked to people... I live in northern California, I've talked to people in southern California and it sounded bad and then the very same [day] I connected and I have a perfect, crystal clear conversation with some guy in Australia.

So it works. This is all cutting edge. And it's nifty but not necessarily it will work every time.

M: [Inaudible]

Braddlee: When you're doing Internet audio conferencing and video conferencing, there is always a small delay which is called latency which is basically you speak, the computer encodes it, the modem encodes it, sends it... but it's a very small delay and usually less than 2/10ths of a second.

And sometimes it's not noticeable at all, not unlike the old..., twenty years ago, making a phone call via... over satellite and you say something and then you could like hear your own voice again as it echoes back. That happens sometimes, but not always.

So *Maven* isn't much to see. It's a one window interface.

M: [Inaudible]

Braddlee: To set up a reflector site, basically you need to have a... I believe they all run on UNIX boxes, so you have a UNIX machine and there's a different piece of software called the *CU-SeeMe* reflector which also reflects for *Maven* since it uses the same audio protocol. And you have to download, compile and set up the reflector on your UNIX box and then give that IP address of that machine to the people that you feel...

M: What does the reflector box actually do?

Braddlee: Basically, as I understand it, it listens to the port, the audio port for *Maven*, from one person and distributes it to everyone who is connected. So if five people are connected, you can think of it as a hub... as the reflector as a hub and there's five spokes coming off of it. And if somebody at spoke one says hello, who is out there, the reflector gets it and then retransmits that information to the other four people.

Kevin Savetz: What that means is the individual client doesn't have to do the work of connecting it to all the other clients. And a lot of the processing mode is done on the more heavy duty hardware.

Braddlee: Right.

M: [Inaudible]

Braddlee: Yes. You can just do a direct, one-to-one if there's somebody in particular that you want to.

M: [Inaudible]

Kevin Savetz: Yes. It's all true for *CU-SeeMe* as well. So basically, I mean, the Internet is itself a uni-direct... I mean not a uni-directional, but a one-to-one transport protocol. That's why you have to deal with this whole reflector business because you talk to the reflector and it talks really individually to the other people. And you can't just broadcast on the Internet.

There is an emerging technology called the M-Bone, Multicast Back Bone, and the M-Bone is a virtual network layered on top of the Internet. It's basically Internet-connected machines that are very powerful that have special software that let them broadcast as opposed to unicast, so if you're on the M-Bone which requires a powerful computer and a lot of bandwidth, you can basically say hi, how are you and yourself broadcast to everyone who is listening on that channel or to that port.

But this is cutting edge stuff. Basically if you want to be on the M-Bone, it requires like a Sun or another high-end workstation and a lot of bandwidth. ISDN won't do it. You need at least a T-1 connection to do a viable M-Bone stuff. A lot of fun, but not ready for prime time if you're just a person dialing in from home or someone at a small business who wants to use multimedia applications.

Braddlee: Unless you want to spend \$1,600 a month on your Internet connection.

Kevin Savetz: Right. Yeah. Next I'm going to bring up... any more questions at this point?

This is *NetPhone* which is a commercial application. It's also commercial quality compared to *Maven*. It has a lot more features and is a little bit less prone to crash. It works under less bandwidth.

Okay. It actually hears me. That's good.

NetPhone has the ability to connect to one particular site or you can connect to a net pub which is a specified meeting place. And I think this is... this product by the way is put out by a company called Electric Magic, www.emagic.com for information. It's like \$50, I believe. So we have connected to the net pub at EMagic. And there's currently two other people there. There is me, Kevin Savetz, and I didn't change my preferences so it still thinks I'm at home in Eureka. And then there's Jay in Toronto, Canada and then this gentleman in Iowa.

So we want to talk to Jay. Jay, can you hear me? Oh he hasn't answered yet. It says waiting for answer. So I've called Jay. I saw him, I hit the call button and he has a little... a ringing phone on his screen which he may or may not decide to answer. If he's already on a call with someone else, he may ignore me.

So Jay's not interested so we're going to hang up on Jay.

We'll try Vincent. Waiting for answer. Of course nobody is interested in talking.

Braddlee: Nobody wants their fifteen minutes of fame.

Kevin Savetz: No. No one wants their fifteen minutes of fame. You can have it ring, you can change the ring sound and you can have it not ring if you're already talking, or you can have it be like call waiting, excuse me I've got a call on the other line.

You can use a bunch of different encoding mechanisms. Some are better than others. GSM and GVSD are fairly standard. I think GSM is the one that is cross-compatible with *Maven* so people don't necessarily have to be using *NetPhone*.

The call was ignored. He didn't want to talk to me.

Some products, especially on the PC use proprietary encoding... audio encoding mechanisms. And that means, if you're using for instance *InterNetPhone* on Windows, you can only talk to people who use *InterNetPhone*. And so far, there aren't any applications for the Macintosh which are strictly proprietary. So they're very cross-compatible. Except *PGP Phone* which we'll look at. If you want to use encryption, you need to be talking to *PGP Phone* as well. But we'll look at that in a moment.

Not being one to give up easily, I'll check one other net pub and see if there's anybody there. There's Jay again, but... okay we'll try Jay one more time and if not we'll get on with our life.

This program also gives you the ability, you can select push to talk if you want to... like a walkie talkie you press the button to talk or you can use a squelch mechanism where whenever you speak it notices that you're talking and so you don't have to actually be at the computer or have your hands on the mouse.

We tried to get someone from Electric Magic to demo it but they're all out of town today. Apparently they're at some show. I can't imagine where.

Braddlee: We can come back to that.

Kevin Savetz: We will... I would like to come back to this later and actually try to demonstrate it, but for now these two guys are dull and we'll just get on with our lives.

Would you like to talk about *PGP Phone*?

Braddlee: Sure. This means we're going to have done three things in a row that we aren't actually going to be able to demo.

Some of you may be familiar with PGP, the program for Pretty Good Privacy which is encryption software for e-mail and files. We're going to hopefully take a look at that a little bit later on.

But at this point, we kind of wanted to talk for a couple of minutes about *PGP Phone*. This is a brand new tool. It is very much in Beta. A lot of the features are not yet implemented. But what *PGP Phone* allows you to do is have secure conversations, phone-style conversations either over a conventional phone line or soon over the Internet, with basically military-grade encryption.

Why would you want to do this? You have... perhaps you have proprietary information that you need to be discussing with someone and you're not confident that the phone connection that you're using is secure.

A lot of the reason for *PGP Phone* being available is an alternative to a government promulgated standard called Clipper and Skipjack which are standards for public systems for doing phone conversations.

One of the big differences between *PGP Phone* and the government sponsored standard is that *PGP Phone* does not require the use of key escrow. Key escrow is a system by which you

and the person you're talking to are the only people that can understand and hear your conversation with the potential exception of the government.

In the Clipper Key escrow system, the government keeps a set of keys to your equipment which under a subpoena they can call back and use to listen in on your phone conversations. A lot of folks who are involved in civil liberties issues have a significant concern about this, specifically relating to the potential for abuse.

One of the things that's going on is that as more and more of the stuff we do becomes wireless, things get around, things become wireless and things that were once wireless, like televisions, become on wires.

A lot of our conversations are available to a lot more people than they used to be available to. And it's not so much a case of you necessarily have to have something to hide, it's more that you don't necessarily want to broadcast your business. So this is the first step towards that type of technology.

The Internet side of this is not yet implemented. It is expected to be implemented by the end of the month. The software is available from MIT.

Kevin Savetz: That is... you can connect over modem to someone else to speak.

Braddlee: That's correct.

Kevin Savetz: But you can't speak over the Internet yet.

Braddlee: So the analog side of this is put together. The TCP/IP side is not yet put there.

Kevin Savetz: The button is there but nothing clicks.

Braddlee: That's right. In order to use this, you have to have what is known as a key pair which is your public key which you can give to anybody, and a secret key which is only yours that you control with a pass phrase.

PGP Phone also uses something called the session key which is to come up with a unique that the two phone share for the length of session. That is generated randomly through the use of spoken phrases. And you repeat a couple of words to PGP and it uses those as sort of a random seed as a basis to develop a session key which is unique to that session between you and the person you're talking to, and then is thrown away now and forever more.

The sound quality on this is, from what I'm told, comparable to *NetPhone*, better than *Maven* and it has the additional feature of being able to have secure conversations.

So, again, all of these are really sort of demonstration technologies. They're not necessarily something that you're going to use everyday but each of them has it's own features that kind of make it interesting in and of themselves.

To get *PGP Phone*, you just go to MIT's Web site, look in the network directory, and actually I'll give you another URL to put up there. And you have to answer a number of questions about where you're from and how you plan to use it. And this is only available currently for non-commercial use because of the license and the encryption software. There will be a commercial version available within a year.

I've put together a list of resources on that and I'll give Kevin the URL and he can type it in. It's a list of quite a few things relating to PGP and security encryption. It's <http://www.scs.unr.edu/cs/pgp/resources.html>.

And that will give you all the pointers to PGP to *PGP Phone*, to a lot of other things.

Kevin Savetz: And the URL that I have put up actually you do it via... get this information via E-Mail or via the Web. It's a pack of frequently asked questions list about audio-conferencing software. It does not focus only on the Macintosh. It basically is a big list of products for the Mac, for UNIX and for Windows and also for OS/2 that you can use to do audio conferencing.

This pack is changing pretty often since this is a really new field, but if you want to know the explicit details or you want to know what about Windows, you can check that fact as well.

M: [Inaudible]

Kevin Savetz: Are they all connection oriented? Yes. They're not a connection until they do open and maintain the connections.

M: [Inaudible]

Kevin Savetz: Well I'm sorry. Actually, no that's not true because with *Maven* if you're not speaking, if you're not sending anything and if nobody is listening, you're not maintaining a connection to the reflector. They are connectionless. But *Maven* at least is connectionless. I don't know about *NetPhone*.

M: [Inaudible]

Kevin Savetz: Probably. Because it uses a different Internet port. Internet has a concept of ports that if you're sending e-mail, you are... you may be using port 25, but if you're using Telnet, the UNIX machine or the [inaudible] use port 23 so basically they can tell, the snoop, can tell what you're doing.

M: But the package themselves, are they audio files or are they scrambled?

Kevin Savetz: They're not really audio... since it's a live thing... I mean when I speak, using *PGP Phone*, it's streaming. So it's not like making a Macintosh audio file. Basically I say "hello" and before I'm finished with the word, the beginning of it is being sent to you. So they're individual sound, soundlets packets I guess.

Braddlee: So anybody that's between you and wherever it is that you're headed who wants to intercept those packets has the ability to do so unless they're encrypted.

It's not that anybody in the Internet anywhere can eavesdrop on your conversation or intercept your e-mail but that potential risk does exist and if someone is very interested in doing it, the technology definitely exists.

Kevin Savetz: We're still going to have wait to demonstrate *NetPhone* but we're going to do it if at all possible.

M: [Inaudible]

Kevin Savetz: We tried to do it. That's what we tried to do.

Braddlee: All of our buddies are flakes.

Kevin Savetz: Nothing. I just don't have any friends.

Braddlee: *CU-SeeMe*.

Kevin Savetz: *CU-SeeMe* it is. And that should work out.

Braddlee: Actually that should work pretty well since we have a nice fast connection. I will get out of your way.

Kevin Savetz: I hung up on him. Bad timing. We'll go in one more time. Someone was calling me. Yeah. But I didn't hear the ring until after I had typed quit. It must have been this guy. And I hope... I think that this is... Hello?

[Voice]: Why did you hang up?

Kevin Savetz: Sorry about that. We're demonstrating *NetPhone* at Internet World. So you can say hi to about thirty people if you want to.

[Voice]: Really? Hey, how are you guys doing? I'm sitting at my desk at work catching up on *NetPhone* and it's pretty cool. Anyone there?

Kevin Savetz: Yeah. Sorry about that. I'm trying to adjust the levels on the mic here. So where are you located?

[Voice]: In Burbank.

Kevin Savetz: Burbank, California. All right. So we're actually, despite what the thing says, I'm in Boston, so I think we've got a pretty good connection for being across country.

[Voice]: Yeah, not bad. It ain't costing you anything to use it.

Kevin Savetz: That's right. So anyway, okay, I've demonstrated this and I need to get on with other things, so nice talking with you and have a good day.

[Voice]: Thanks for blowing me off, buddy.

Kevin Savetz: I've played with... I mean, it sounds pretty good I think. And *Maven* sounds almost as good, but I may have totally messed up here. My problem with this is, although it's fun, it's like CB radio or ham radio, you're talking to strangers and you're like okay, what am I going to talk with you about. So in my opinion, if there's someone out there you want to talk with, that's, an associate or a friend already, it's quite useful assuming they have the same similar software.

And if you like chatting with random strangers, you can do that do. I've used it from California to talk with my friend, Dave Taylor, who at the time lived in Indiana. So we saved a couple bucks on phone calls and we only spent half of our time going what, say that again? But it was free damn it, and that's what's important.

M: [Inaudible]

Kevin Savetz: Right. With this program, assuming...

M: So you can't just use an e-mail address to sort of establish that you have the software?

Kevin Savetz: Right. If you want to connect with a particular person, you can type in the IP address or the name of their machine. And you have to know... it's not like an e-mail address. You have to know their certain IP address. And if you want to just talk with a stranger, then you can go to a net pub and it will do the dirty work for you.

There's also a problem, a glitch I guess, with *NetPhone* and all these products, if you are using ISP, an inter service provider that gives you dynamic IP addresses, that is every time you log in you could be... if you have an IP address, then you don't have a set home where your friends can find you. And there are ways around that but it's another piece of software that gives you like a fake IP address, a fake domain name so people can find you.

But anyway, now you've heard it and we talked with some guy in Burbank.

Next up is *CU-SeeMe*.

Braddlee: Yep. *CU-SeeMe* is video... desktop video conferencing software developed by Cornell University. It's being used a lot, particularly in K-12 for things like collaborative education, small groups of students working on things like science projects, research, this type of stuff.

It makes use of something we talked about this morning which is the Connecticut *Quick Cam* which is a \$100 hardware widget that is a [inaudible] device, black and white, 16 gray scale video camera that you can see up on that sign. Kevin has connected to himself. That is Kevin because we can see his name above the frame.

CU-SeeMe also works like *Maven* through the concept of reflectors which means that you can have a remote hub running at this time only on a UNIX host. Did you try a unit?

Kevin Savetz: No, I didn't, no.

Braddlee: If you can get in, that's probably your best bet.

An individual reflector will support up to eight to twelve conferences at the same time. One of the things you can do with *CU-SeeMe* is that by building reflectors on top of each other, you can have sort of the mother reflector, talk to other reflectors and then each of those eight reflectors can talk to either more reflectors or to eight individuals per unit.

You can develop large video conferencing that way. *CU-SeeMe* at that level is much more effective to have a small-scale broadcast tool rather than as an actual conferencing. You don't really want to run a 64 person forum using *CU-SeeMe*.

Kevin Savetz: Not that there would be room on your screen with all those windows.

Braddlee: Right. Exactly. Actually, I think actually the client stuff actually maxes out at 12.

Kevin Savetz: Okay. I usually have luck with Cornell.

Braddlee: Now what we're doing here, we're trying to get into a public reflector. These are pretty popular and you get this a lot. Too many participants. So... and I have a private reflector running down in Las Vegas but it has blown up on me so we can't connect to it.

Kevin Savetz: You can actually change, if you want to you can have it mirrored. Whichever, nearer to you or not nearer.

Keep talking, I'll keep trying.

Braddlee: Yes. One of the things that *CU-SeeMe* does is that... there we go, so this is probably broadcast only. So, tell it to "show all." Yeah. And then turn off.

Kevin Savetz: We're not broadcasting.

Braddlee: What you're going to see here, is you're going to see the current shuttle flight. NASA runs a reflector which is a broadcast reflector. It's not... we're not going to interact with the folks at Mission Control right now, but what they do is they run a live video feed 24 hours a day, 7 days a week.

And [inaudible]... This is great fun because you can really impress your friends that you've been watching the space shuttle on the Internet. Also, quite often they show views of earth from the space shuttle, and it's just really cool. You can see yourself floating by.

If you have cable, they also broadcast this on... like on it'll be like channel 103 or something like that and they never tell you about it, but you get the same thing on the Internet. It's a reflector you can usually get into.

Kevin Savetz: It's a great way to short band within your local area network and really like endear yourself to your system administrators and local network folks.

You'll notice that right now we're running about... I'm below the Mission Control window. This is fairly slow for *CU-SeeMe*. We're only running about one and a half to two frames per second but we're using 43Kbs bandwidth.

Braddlee: Right. So this is using...

Kevin Savetz: Half of a full ISDN link.

Braddlee: Right.

Kevin Savetz: Pretty much. And we're not even sending video which would take even more, so if you have a network administrator that likes to watch current bandwidth usage and you want to make sure that they're awake, go ahead, plug this in, watch the numbers jump and have them come by and go, "what are you doing?" Then you can show them and they'll go either like "wow that's really cool" or "get that thing off my network." One or the other.

Now if we have heard *Maven* before, you would recognize that crystal clear sound quality from *Maven*.

Braddlee: Also, that sound is coming from space.

Kevin Savetz: Yeah. That is true. Oh well. Okay. Yeah, basically *CU-SeeMe* ... *Maven* was done by a guy, Charlie, do you remember his last name?

Braddlee: I don't.

Kevin Savetz: Charlie Pride. No. Done by a guy at the University of Illinois. *CU-SeeMe* used to be a video-only thing and they said hey, you've got an audio product with no video, we've got a video product with no audio, lets put the two of them together.

Braddlee: Okay. If you go into some of the public reflectors, which we will get into, I promise, you will start... if you ever used IRC, Internet Relay Chat, on a regular basis you will notice that certain people are there all the time. These are what we call the addicts. And *CU-SeeMe* has its own few addicts which are just basically the same as the full-time mothers except people with more money and better Internet connections.

Kevin Savetz: Or offices.

Braddlee: Or offices. Or whatever. Some people... I mean, it's fun... if you have the bandwidth to spare you come in in the morning, you log into *CU-SeeMe* and then people can come in all day and see you typing at your machine.

Kevin Savetz: One of the things that *CU-SeeMe* has is if you don't have enough bandwidth to run both the audio and the video, you can do incredibly slow video, like .6 frames per second video and then go ahead and talk down the window.

M: [Inaudible]

Braddlee: If you're doing it just over your internal LAN, for example, my boss works down in Las Vegas, I work in Reno. Usually the days that I'm down in Las Vegas, he's up in Reno. And we tend to miss each other a lot. So we actually use *CU-SeeMe* for real stuff.

We have meetings once a week and generally what we do is we put the speaker on to get the better audio quality over the telephone and then just use the *CU-SeeMe* window as a way to have a chance to see what each other is up to and to be able to have a little more [inaudible].

That I think is pretty much one of the things this is really good for. It's good for small scale video conferencing and linking with somebody on a regular basis.

We have large scale video conferencing [inaudible] compressed video sites straight across the state, but you have to schedule those. We don't have to schedule the use of *CU-SeeMe* and *CU-SeeMe* doesn't cost a hundred dollars an hour. [inaudible]... still working on the compression and they're still working on the [inaudible].

You can see how it's chunky. It starts building the information based on... Stuff that looks the best, frankly, is stuff that's not moving, but the backgrounds, the desk that no one is sitting at looks really nice. And the way the encoding works is that it only updates things that move, so if someone is jerking their head around a lot they're going to appear very chunky and you just might see great globs where their head used to be.

And the faster your connection the better it looks so it looks more at the center of the screen [inaudible] critical information than around the side, but basically the software itself looks more at the center.

So, Doug is there.

Kevin Savetz: Do you know this guy?

Braddlee: So here is this guy and he can [inaudible] the very bottom and there it is.

Now this gentleman is the only guy who is logged in who is currently using videos in *CU-SeeMe*. However, there are five other people who either don't have their cameras turned on or perhaps they're using *Maven* [inaudible]. That voice you hear is some of these non-video people talking to one another.

What's he doing? Oh he's waving. My monitor is up there a little more frequently than hers. She's just like sitting there doing [inaudible].

She sees us. Yeah. We haven't spoken with them but...

And things get... oh, and actually Kelly is looking at me [inaudible] open and she's looking at me.

We can change all sorts of things, whether they can you and you can get data on how much bandwidth you're sucking and how your... how many packets you're losing and that sort of thing.

But basically we are sending at about twenty... at this time between ten and twenty kilobits per second and we're receiving at between about twenty kilobits per second. So we're sucking a good amount of bandwidth.

Braddlee: ... packets which are [inaudible] please deliver me quickly but if you need to drop me on the floor that's okay. And that's why we're losing so many. There are other packets which are high priority, I mean, they can be delivered more slowly but they're more important and they'll be delivered with more accuracy. Does that make sense?

Kevin Savetz: I think that's *CU-SeeMe* in a nutshell.

Braddlee: That's *CU-SeeMe* in a nutshell. And are there any questions? Yes sir?

M: I'm going to have to get a big blackboard or piece of paper that I can...

Braddlee: No they don't. Actually you get some reflector addresses in the package. The commonly available public reflectors, those are the ones we've been banging on. There are a couple of Web sites that deal with *CU-SeeMe* which the most obvious one is *CU-SeeMe*, *SeeMe*, all one string.cornell.edu.

And there's a link to there to a guy at Indiana State. And I can't remember his name off the top on my head. But he has some very good information about *CU-SeeMe* as a Web resource. One of the things that he has is the *CU-SeeMe* reflector list which is a list of a lot of the publicly available reflectors.

The last time I looked for a *CU-SeeMe* reflector list, the only one I found... this was, I don't know, a month and a half ago, the only one I found the guy wanted money for. And that would have been okay but then he wanted me to pay with net cash or something, and I would have sent him a dollar or whatever in the mail but he wanted me to pay with net cash and I didn't want to get into setting up an account and all that garbage. And I didn't want to get into net cash...

What he did was he set that up to encourage people to use E-cash because he wanted his people to start experimenting with the idea of doing financial transactions over the Internet. And he was charging a quarter a pop so it wasn't like he was trying to make money on it, he just wanted people to use the technology. It was something that he had that was in demand and he felt that the quid pro quo would experiment with this.

He promised the e-cash trial ended late last month, and now you have to deposit real money which you didn't have to do before. And e-cash would just give you funny money to play with. I sent him an e-mail and said, hey the e-cash trial is over so the list is now available.

It should have been unlocked. He said he was going to.

Kevin Savetz: Okay. Cool.

Braddlee: So you should be able to get to him.

Kevin Savetz: Now you know, now we know.

M: [Inaudible]

Braddlee: Yeah. Kevin, put it up on the screen.

M: [Inaudible]

Braddlee: There is a Windows version of *CU-SeeMe* which I have not used but apparently it works pretty well, but it will not encode audio. It will play audio however.

Kevin Savetz: And the one that encodes... and one of the limitations was that the CUC, the Connectics Cam for Macs... for Windows wasn't available until middle...

Braddlee: Yeah. It just came out really recently.

Kevin Savetz: Right.

Braddlee: In fact, I'm sure if you try to order it today it will be on back order. I mean it just came out.

Kevin Savetz: Yeah. But it's something that is theoretically possible.

Braddlee: And you also need a video card.

Kevin Savetz: Not with the *Quick Cam*.

Braddlee: Not with the *Quick Cam* ?

Kevin Savetz: Serial port.

Braddlee: Great, good. Okay. That's progress.

Kevin Savetz: Cheap and dirty.

Braddlee: Great. Lets move on. Next question?

M: When someone uses *CU-SeeMe* to do essentially a broadcast [inaudible]?

Braddlee: No, they're still using the reflector technology to... you're hitting one reflector which is basically broadcasting but it's not really, it's saying here's some information, here's some information. It's not really..., it's not like sending it to everybody at once. So it's using the reflector.

The M-Bone technology is going, I believe will be available for the Macintosh in six months or so. Apparently there are... the low level M-Bone tools are being developed. And once those are developed, programs like *CU-SeeMe* will be able to use the capability.

So not available for the Mac at this time unfortunately.

Kevin Savetz: Now is it true that... I remember hearing some contacts though that M-Bone stuff can be piped to *CU-SeeMe* reflectors and then...

Braddlee: Yes. Basically the reflector can listen to the M-Bone broadcast, or multi-cast.

Kevin Savetz: But it's not a full-fledged participant?

Braddlee: Right.

M: [Inaudible]

Braddlee: I don't believe it's the same thing.

M: I just wondered if it's same reflectors.

Braddlee: I don't think so.

Kevin Savetz: No, you can't. They're not inter-operable. What they've done with it, they've done a lot of fiddling to make the *CU-SeeMe* stuff work. They've taken some bits and pieces from other things. I think, is [inaudible] the audio protocol that *Maven* is using?

Braddlee: Yes.

Kevin Savetz: That is a fairly standard UNIX protocol, so that that side of it will interact with a lot of stuff that you'll find kind of coming off the disk and the UNIX boxes. But the video stuff itself, they've had to do a lot of... not proprietary tricks, but they've taken the stuff that was existing and really done a lot to tweak it.

Braddlee: Yes sir?

M: [Inaudible]

Braddlee: I think it was... I think that that was actually a tool that lets, that gives you the talk window. It's called *Talk FM*, and frankly I don't know what the FM stands for. But that's kind of a plug in that gives you that talk window for the chat window to use.

Kevin Savetz: Any more questions? Where do you want to go today?

Braddlee: Well I'm operating. Sorry.

Kevin Savetz: Away from Redland.

Braddlee: Okay.

Kevin Savetz: Do we want to talk about NewsNet or do we want to talk about WAIS? I can try to see if we can find a non broken WAIS surfer.

Braddlee: Lets talk about WAIS.

Kevin Savetz: Okay.

Braddlee: We're going to switch from multimedia for a moment to some other stuff. And WAIS is [inaudible] Information Services. It's basically a database access tool. MacWAIS is a really nice WAIS client. The frustrating part in this is that sometimes the WAIS servers are flaky and difficult to access except for the for pay ones.

A real... probably the best, one of the best examples of a WAIS servers is the Federal Register which is available through `wais.doc`.

Now, what Kevin is doing is that...

Kevin Savetz: Let me just clarify something. WAIS is different from all the other Internet search tools, *Veronica* and *Archie* and *Webcrawler* and all those things because WAIS does full text searches. So basically, if you have a lot of text information, you run it through a WAIS server, which it does the heavy indexing and then you can easily search through that text.

WAIS is very powerful, not very easy to use, although MacWAIS helps move it along. And it never... it's been out for a while and it just hasn't grabbed the attention of people, despite its power. It's not real sexy, and as I said it's a little bit hard to use.

Braddlee: And there are a couple... Dow Jones is using WAIS. There are a number of good commercial WAIS implementations. A lot of them are like \$59 a month which is why I don't have three or four of them loaded.

Kevin Savetz: Right. And there are a lot of free databases via WAIS. We'll look in a minute. We'll look at a poetry database. Also, it's very common for a Newsnet new groups to be indexed in WAIS, so you can go back to the recipe, the `old.vegetarian.dot` recipes archive and basically search through every recipe that's ever been posted in there because somebody put it in WAIS.

So that's what WAIS is.

Braddlee: After your operating a schedule program.

Kevin Savetz: Yeah. Using WAIS is kind of a two step process. What I do... the way I think about this is there is a directory of servers and that's what is currently highlighted up there. So what I do is I go in and when I first select a database, the first database I select is the directory of servers which is essentially the databases of databases.

And then it says tell me about, do we want to try poetry?

Braddlee: All right.

Kevin Savetz: So we want to know about poetry. Then it has... we're hopeful... we're saying hey, are there any poetry databases out there in WAIS? And this server is going to tell us if there are.

Braddlee: Notice we're not saying female poets and first name begins with B.

Kevin Savetz: Right. Really general, are there services out there about poetry. And it has found several. One is something called the poetry index. And some of these are kind of cryptic.

There's something called the ANU Buddha-L.

Braddlee: That's Australian National University. ANU has a whole slew of these things, some of which are indexed news groups, some of which are...

Kevin Savetz: Looks like an indexed mailing list, Buddha-L.

Braddlee: Yeah. Right.

Kevin Savetz: So apparently, it's a mailing list that they talk about poetry.

Braddlee: Buddhist poetry.

Kevin Savetz: Yeah. Buddhist poetry.

Braddlee: And you can why don't you just select poetry index and bring up the viewer.

Kevin Savetz: Okay.

Braddlee: So we're going to take the poetry index which has a score of a thousand and so it really thinks that this is on topic. We're going to hit view and it's going to give us some information about.

This is an index of all the poems and reviews published since Volume 151, October 1987 in *Poetry Magazine* of Chicago.

So what we have here is a big index of poetry and we save this link, basically this is a... we save this bookmark, which I already had one, but hey, we just updated it. And now that we've found the index that we want to search, we're going to search that index.

Kevin Savetz: Right.

Braddlee: So this is part 2 and if I can remember how to do this.

Kevin Savetz: Back to sources.

Braddlee: Sorry?

Kevin Savetz: Back to sources.

Braddlee: Back to sources.

Kevin Savetz: And then edit or select.

Braddlee: Okay.

Kevin Savetz: Sorry. Select.

Braddlee: Sources, select and now we want to... we're not going to search the directory of servers anymore but we are going to search the poetry index.

Kevin Savetz: Do you want to talk about Frank O'Hara.

Braddlee: Sure. Frank O'Hara would be fine. So now we're going to tell me about Frank O'Hara and we're going to say ask. It's going to... now it's in a searching directory of servers it's going to search the poetry index. Initializing connection, thinking about it for a while and look at that. It has several hits.

Now you notice over here there's the score. This means a score of a thousand. So according to WAIS this is really, really about what we asked about. A score of 358 is much less... it talks about Frank O'Hara but not so much and a score of 178 down below which might mention him in passing but probably isn't what we want.

Kevin Savetz: And what are the possibilities for those low scores too is it's talking about somebody named Frank but not necessarily Frank O'Hara.

Braddlee: So I clicked on view and apparently it's giving us an abstract.

Kevin Savetz: A citation, yeah.

Braddlee: A citation of the information that's there. And can we get the actual information?

Kevin Savetz: No. That's going to be the fullest... that's going to be the full. What you've got is you've got the index.

Braddlee: We have an index.

Kevin Savetz: Right.

Braddlee: Okay. So now the thing is... so that's an example of how you would retrieve one piece of information. If you were going to use this for the Federal Register, the way the Federal Register works is if you were at a public library, you can get an IP, so you can get them to turn on your specific IP address. Or you can do for free or you can do it as a subscription to the Federal Register for a fee.

You can get access to and be able to search using the WAIS indexing. Everything that comes out in the Federal Register the days that it's published.

So if that's something that is of interest to you to be keeping up with announcements and bids on bids on government contracts, changes in regulations, new types of information that's coming out from the government.

This is a real nice tool to do that with. It's something that I use with librarians at Paramount.

Kevin Savetz: The database that we were just searching was only an index to stuff in the magazine. And I would like to make it clear that there is more tangible, useful information in the right databases.

I did this search once before and we were just searching the wrong place, but I'm going to try to duplicate this now, I went to poetry, one of these poetry indexes. Actually there's real poetry in there, so I went into there. I typed e. e. cummings and actually got some cummings poetry. So that's something that can be useful.

M: [Inaudible] and it seems like all of a sudden, and the Web becomes sort of a glamour application of the Internet, have you seen or is there any way to determine this, a decline in the

kind of... type of information that are being put into like WAIS servers instead of people putting all their effort and energy into Web servers?

Kevin Savetz: I've been thinking about that a lot. I think one of the things that I would say is that there is more free information coming out, but what's happening is because of the growth of the Internet as a whole, there is a huge... a vastly greater amount of pay information or things that are hybrids.

For example, when I think of that, I think of something like CARL, the Colorado Association of Research Libraries where they have... you can go in... you can for free search the on-line index. They index 17,000 journals. And you can get back citation information and limited abstract information on any of those journals for free.

However, what they really want you to do is to request fax copies of the articles, which they'll charge you anywhere between \$8 and \$30. Now if you need that information in a hurry, that's a very useful service.

Braddlee: You picked a really interesting poet here. I'm actually reading some of his stuff.

Kevin Savetz: Yeah. I picked a different database called poetry.source which isn't just an index, it actually has some information and I found some poetry by Frank O'Hara and I also found a biography of him. So this is full text information, not just abstract. So I actually got... did something... we learned about Frank O'Hara.

I didn't mean to interrupt you.

Braddlee: That's okay. That's fine.

Kevin Savetz: So there is free information coming out of the Universities and individuals and all these people have traditionally put free information up on the Internet are doing it, but a lot of other people are doing it and charging for it as well.

I think we're going to see a lot more of that. And I have mixed feelings about that. I think it's good and useful that we're getting that information out there.

M: The people that are putting that information out, are they putting it... the people that are charging for it are putting it... are they tending to put it up on Web sites or are they tending to put it up on a WAIS servers?

Kevin Savetz: Well see, it's not necessarily initially exclusive.

Braddlee: You can access [it anyway] via the Web.

Kevin Savetz: Right.

Braddlee: And so, in some... a few cases, people are putting stuff up via WAIS servers, but you can access them through your Web client and maybe not notice that you're using WAIS.

Kevin Savetz: Right.

Braddlee: It just seems to be an elegant search tool that you're using. And you can avoid this kind of clunky interface.

Kevin Savetz: And whereas you have..., rather than having SQL, all databases will be an extra WAIS server or something.

Braddlee: So I think that the short answer to your question is, people are in general leaning towards the Web but you're going to be able to do things through your Web browser that you might not even have to know that you're using WAIS, even if you are, or other even better search tools.

Kevin Savetz: And you can have WAIS URLs. So that's I mean the browsers will speak, these multiple protocols... WAIS is one of those protocols.

Braddlee: Are there other questions? I read some stuff by e. e. cummings too.

M: [Inaudible]

Kevin Savetz: No, this is free. This is one of the random databases that are out there. This one is called poetry.scr.

M: [Inaudible]

Braddlee: Shareware I think.

Kevin Savetz: Actually [it] just went to be free. That version still thinks it's shareware but when I sent them the money for it, they sent me back a note saying thanks for sending us the money but we're going to return your check because it's going to be free in a couple of months anyway.

Braddlee: So that's a misunderstood but useful tool.

Kevin Savetz: Keep going. Keep cool.

Braddlee: Lets see. A couple of other useful tools while we're just kind of playing catch all, there is a useful program called *MacTCP Watcher*. If you've ever had an Internet connection that didn't quite work, you're just trying to get it set up and you're not sure what's wrong, *MacTCP Watcher* is a freeware I believe... yeah, it's free for non-commercial product that lets you diagnose Internet problems.

It's not real sexy but, you know, it does the job. For instance, if you need to PING something, say "well, do I have Internet kind of activity, can I reach other computers that are out there?" It will send out PING packets and say you there and say hey you there every few times a second. You can see if your Internet connection is reliable. In connecting to this computer, I can get there 80% of the time.

Kevin Savetz: Well, we're fast but we're not reliable.

Braddlee: We're fast but we're not reliable. Right.

Kevin Savetz: Yeah. 20% is pretty unacceptable.

Braddlee: I happen to know that... so we know that... all right, we have a connection but things aren't perfect. That computer is usually pretty slow anyway. And that can be the problem or a connection might be noisy or something like that.

Kevin Savetz: See, just to give you an idea, last... you can see that we're talking about, like, 16/100ths of a second, 15/100ths of a second.

Braddlee: To get to California.

Kevin Savetz: Right.

Braddlee: Last night, in my hotel room through my commercial Internet provider on the 28 PPP connection, it was taking me an average of 1.54 seconds to get a packet turned around between here and the West Coast which is not acceptable.

So it's a real basic level tool itself. Are you getting through, hello are you there, which is more reliable as a basis for complaining about a connection than "my Netscape won't work." Because you can come back to the provider and give them real information, and say, I'm losing 35% of my packets and it's taking a second and half for turnaround time and you need to do better than this.

Kevin Savetz: There's another diagnostic kind of tool called *MacTCP Monitor* which deserves about two minutes of our time which lets you know when you're using other applications... I'm going to bring up a Web page here.

It lets you know how fast you're actually moving information. And it basically gives you a bar graph with all these pretty little bytes that tell you how many... I think this is bytes per second you are currently moving right now. So as we download this Web page, 8,652 bytes per second is our maximum which is pretty darned fast.

Braddlee: Lets bring *CU-SeeMe* back up for a second.

Kevin Savetz: You want to? All right.

Braddlee: I'm going to ask you this live because I haven't asked you before. Do you know anything that does trace routes?

Kevin Savetz: There is a program called *MacTrace Route*. It only works over the Internet connections.

Braddlee: Okay.

Kevin Savetz: It doesn't work over modems. Do you understand what trace route is?

Braddlee: Sure.

Kevin Savetz: Trace route is something that will go along with PING and DNS Check and the other things that are in *MacTCP Watcher* in that what will happen is, frequently if you have a broken Internet connection, you kind of want to know what link failed.

Trace route traces the route your packets are taking from your Internet-connected computer to the destination you're trying to reach and provides you back with information such as how long it took to make each of those hops.

And really, if I understand it correctly, really what it is is successive turns but it takes each of those steps along the way and comes back with the information.

So that's another useful thing to have in your toolkit if you are trying to find out why you can't get to a particular Web site. And it gives you the kind of information that you can then feed back to your network administrator and your net service provider about why something isn't working. And this may not be something you may use everyday, but when you need them they're really helpful to have.

[Inaudible]

Braddlee: Oh it's not UDP. It doesn't look UDP. So anyway, we can't see exactly how much bandwidth we're sucking, but too bad. So those are two useful diagnostic tools. I'm trying to think if there's anything else that you just need to have.

Kevin Savetz: And those are... how about Switcher?

Braddlee: *MacTCP Switcher*... for instance, you have a PowerBook and you use it on the road and you use a modem to dial into the Internet but you also have an Ethernet connection in your office, those probably require different setups in *MacTCP*., you have a different server information or you have to dial in with *MacPPP* with one but not the other.

MacTCP Switcher is a simple program that lets you save two or any number of common configurations. So when you're on the road you can very easily switch your settings to one way and when you get back home you can switch them to another way.

It's a little shareware program and it works. It's a one trick pony but works well for what it does. And if you travel a lot or if you're on two different networks somehow it can be useful. There is a point or two I believe in the handout as well.

Several people are asking about servers and so I would like to get you going on that.

Kevin Savetz: Okay.

Braddlee: Since this is your thing. FTP servers and all that good stuff.

Kevin Savetz: Sure. Okay. There are a couple of things about servers. Obviously what we've been looking at up to this point has pretty much been software for allowing your Mac to bring other things in off the Net.

Another thing that you can use your Macs for is to provide information. There are a couple of these. The first one, and to be honest this is a brand new version that I haven't even really looked at. It's called *FTPD*. It's by Peter Lewis. And you've got two components of it.

The first side is *FTPD Setup*. What this is asking about, this is saying... this is an *FTPD* and most of the Peter Lewis applications, in addition to using *Internet Config* which we talked about some this morning, also take advantage of *Civic* which allows you to... allows the provider of the software to let you know when it has been updated.

And so what this screen is doing is saying if you want to allow *Civic* and you want me to let you know when I have a new version of this out, go ahead and say yes. If you don't want me to know that I'm using this program, then just disable it. And since we don't really have anything to hide, we're going to say allow.

The FTPD startup screen is \$10. Say thank you. And go to the main screen. This is kind of interesting. This is something that changed in the last... recent version. FTPD used to only do FTP serving, the File Transfer Protocol. We looked at *Fetch* this morning and *Anarchie* this morning as ways to get files off the Internet. This allows you to serve them.

On any of these server software that we're going to talk about, I would pay very close attention to how you're setting it up. If you're not familiar with users and groups and some of the basic ideas about how to do security on a Macintosh, you're probably better off leaving these things alone because you have the potential to set things up in a fairly unsecure fashions.

We'll take a look first at the FTP setup. So for example here, I'm going to set this up just the way that I have mine set up on my Mac back in my desktop which is that I don't give users and guests any privileges. I don't let anyone other than myself log into this. But I give myself full privileges so basically I can upload, I can download, I can delete and I can move things using FTP.

Braddlee: So if you forgot to bring something to Internet World, you can right now log into your home machine?

Kevin Savetz: Exactly. I can log into the machine on my desk and as long as it hasn't crashed since the last time I've left... for example, our site doesn't support ARA. I can't use that for remote access through our modem pool which is something that I find kind of frustrating but the Novell people can't use Novell either, so I guess we're kind of on even ground there.

But we do do TCP/IP in the modem pool, so I can set the FTPD server up on my Mac and the file that I've invariably left behind I can then get in and get access to.

Down here we have some control about maximum of users. I think 999 is a little excessive. I hope... really hope that you're not going to try to run a thousand FTP, simultaneous FTP connections off of a Mac. They actually do much better at this than a lot of the people think they do, but I don't think that you'd want to run that.

So all I've done here is just turn myself on as a user, so I'm going to say save for this.

Braddlee: But if you want to run in the anonymous FTP site, you can certainly do that by allowing guests.

Kevin Savetz: That's right. For FTP users, basically what this is is this tells you to set up a particular directory so if you do want to give users other than yourself access to the site, or you want to, in the interest of having better security, have even your own access limited to a couple of files or a couple of folders, this allows you to set this up, to set up a folder as your particular log in directory. Probably pub would be a good name to start since that's the convention from the UNIX FTP.

Go ahead and save that.

M: [Inaudible]

Kevin Savetz: That's right. It only allows from there down so in other words, if you have a pub directory, only things that are in that pub folder and folders inside that folder people will be able to [be] looked at. They have no access to anything else. None of your WordPerfect files, none of your Lotus spreadsheets, none of your Excel stuff. Nothing else, just things that are in there.

There are a couple cute things here that you can do here about speaking messages and play sounds so that when it tells you it's woken up and someone is trying to log into your computer, it gives you an alert on that.

User restrictions: gets, puts, whether or not they can upload stuff, whether they can download stuff, allowing them to change their individual passwords, allow them to do Apple script searching I believe, allow them to delete or rename things.

You can allow people some fairly serious stuff here if you're not careful about how to set this up.

Sorry. We've just been there.

Okay. Now, one of the neat things about this is that it will also be a *Gopher* server and you can give it a name as a *Gopher* host and tell it the root directory in the same way that you gave it a root FTP directory. Set it as to whether the *Gopher* course is [the] standard port 70 or someplace else. And then you would turn the *Gopher* on here.

Okay. So if you want people... *Gopher* clients to be able to access your Mac and provide *Gopher* information, this is a \$10 tool that will let you do this. And not only that, but it is also a limited Web surfer.

So if you've got... I wouldn't try to run the *QuickTime* www.quicktime.apple.com off of this but if you've got a couple of pages that you want to serve internally, or you've got a small site that you want to put up and advertise but you don't expect it to have a huge amount of traffic, this is the way to do this.

Braddlee: You don't have a real Web server. There are dedicated server tools for doing that. That's right. Do we have HTTP on your drive?

Kevin Savetz: I don't think so.

Braddlee: Okay.

Kevin Savetz: It's not much to see though.

Braddlee: That's right.

Kevin Savetz: No. And we'll talk about it though. So then we've got the summary. This is basically everything that's going on. FTP is not running. File sharing is enabled. User can log in. Guests do not log in. That's how we set that up in FTP.

I have full access. Nobody else can get in. We didn't turn on *Gopher*. We didn't turn on Web.

Now you have to have file sharing on in order to do this because if you don't have file sharing on, you can't serve anything because that's a necessary and sufficient condition.

Braddlee: We have just set up a working FTP server basically in the time that you were watching this.

Kevin Savetz: Right.

Braddlee: I have done it for UNIX. It took days.

Kevin Savetz: Oh yeah.

Braddlee: In UNIX, everyone... a lot of people that use UNIX, UNIX is a great operating system but if you're interested in just doing something and you want it to work well and work quickly, Macintosh is a fine way to do that because... I mean honestly, I've done it on FTP and

there's lots and lots of security issues, compiling your FTP server when the one that came with it didn't work quite properly.

So basically what we did in five minutes can take a lot longer on UNIX.

M: [Inaudible]

Kevin Savetz: It depends on what you're trying to accomplish. For example, I would have no problem about running all these things off the Quadra 610 that sits on my desk.

Braddlee: Yeah.

Kevin Savetz: As long as it has a decent amount of memory and a fast Net connection just like you would have for a UNIX machine.

Braddlee: Right. Because it sits on the Ethernet connection in the computing center about fifty feet from our Hub Router. Also, I'm not trying to use it for heavy-duty stuff. And this is actually connected to my FT... this is my Mac back in Reno using FTPD and basically there's a welcome message that's like, that's Gertrude, that's the Mac's name and it's saying how is it going out there in the world. How come I never get to go anywhere like Howie does? This is Howie over here.

Okay? It says if I'm logged in, and directory's route and from here basically I can see my whole hard drive. Okay? And you can see exactly how tidy or untidy I keep everything.

You know, and I can go in here, I can go to PowerPoint. And I can come back in and I can retrieve my PowerPoints, my PowerPoint demo. So if I've gone out and I've found out that the version that I have is the wrong version or whatever, bingo, zap, we grabbed it.

And it keeps logging. It does a nice job of that basically. What I've done, too is, the other part of this that we should really show you, is what I had showed you before with the set up information was one program called FTPD Set Up. The program that actually does the serving is this guy here, FTPD, the FTP Demon.

And I've stuck him in my start up folder and the systems folder and so that every time that the Mac boots up, that's automatically fired off. Okay?

And I keep a couple of these things. I keep FTPD in there. I also keep a Finger Demon that responds to Finger requests. I also keep a Talk Demon that responds to Talk Internet chat requests.

And so those automatically just start up. And the FTPD keeps nice logging. It keeps it for as long as you want. It tells you who logged in and how long they were on for, what they took, what they put up. You know, pretty much everything that you would want.

And it's a high security, low cost...

Kevin Savetz: It's very high security and the reason is, unlike if you have a UNIX system which is really the thing to compare it to because that's where traditionally all of this stuff has been done, if you set up a UNIX machine to be an FTP Demon, the UNIX machine probably by default also knows how to do Telnet and do Mail and everyone of those layers has potential security problems.

And there is a few old ways to hack into a UNIX machine, get route access, get super user access to the system using only e-mail.

With the Macintosh it's simply not possible. If you only want to serve FTP, it's the only thing you have running, there's no way anybody can send you e-mail or can [TelNet] into the system.

So it's a very, very secure way to go. And it's even more secure if your Macintosh is not on... isn't connected with... you don't have all of your business's private information on that Macintosh; you keep that elsewhere on the network and it's even more secure.

Braddlee: Yeah. I had an interesting conversation. It's one of the things I'm looking at right now where I'm working is, we want to do some fairly serious Web serving and the question is do we get a Netra and get Netscape which, even though the Netscape software is free for us, there's still the question of using it and administering it. Or do we get a Mac Internet server and do we use Web Star which is the commercial version of Mac HTTP, the free Internet Web server.

Even though I'm fairly Mac biased, I try to keep an open mind about things and really, at the end of talking to the Apple folks and talking to the Web Star folks and talking to a couple other folks about things like CGI Bin and databases and add ons and the stuff that's going to be available both now and over the next six months, I don't really feel like... particularly when I look at the cost of administering the server in terms of my time, in terms of network administrator time, in terms of difficulty for use both for the users, many of whom are Mac people and who want to do Web development but just really don't want to learn UNIX stuff.

I think it's going to be the performance actually at the low end is higher. You can get a \$3,000 Mac Internet server and the performance is close to a \$7,000 to \$11,000 low end Netra UNIX server.

Kevin Savetz: And a lot easier to set up.

Braddlee: A lot easier to set up. There are some fairly basic tricks that you can play about spreading the load over multiple servers. Right now a Mac can handle a total of 48, I think it is, simultaneous connects... simultaneous in-bound connections as a Web server.

Kevin Savetz: Which is a lot because you're only connected for what, two seconds or something, for most...

Braddlee: Well, actually what it means is actually opening that port. And 48 people all at the same nanosecond saying gimme. And what you can do is through DNS, you can assign your home page or top level page across multiple servers.

If you're getting a hundred hits... a hundred simultaneous hits, you've got a pretty significant project going, but what you can do is in DNS you can randomly assign that initial hit across the servers so you spread the load that way.

Also, by spreading the load across your site in terms of where individual pages lead, which server they go to or for example which server is going to run mail list stuff or database stuff in addition to serving up Web pages.

You can have something which is distributed and really quite comfortable to work with. And I frankly don't see a whole lot of reason unless you're doing something huge to really do UNIX unless UNIX is something that you do already and that you love and that you want to use.

Some of the... there are some flexibilities that you have in UNIX that you're not going to have quite yet in the Mac stuff, but the gap is closing real fast and again, one of the things that helped really kind of resolve things for me was, take a look at the Apple *QuickTime* Web site. That site takes a million hits a day and it is serving up not little text pages but it's serving up *QuickTime* videos, one, two, three meg files. And what they're doing is they're serving all of those hits on eight Internets or on eight Apple Internet servers.

So in other words, for about an \$80,000 investment in hardware and software, they're serving one of the biggest sites in the Net and have very low system administration costs and a very high level of security.

M: [Inaudible]

Braddlee: Yeah. There is Mac DNS.

Kevin Savetz: Mac DNS. That just came out of Beta.

Braddlee: Yeah.

Kevin Savetz: So it's a commercial product and it works.

M: [Inaudible]

Braddlee: It's a commercial product.

Kevin Savetz: It's a commercial product. It's not on our list.

Braddlee: Yeah.

Kevin Savetz: You can get it from Apple I believe.

Braddlee: Right. And I think I may, if I root around I might be able to find some contact information or give me your information and I'll figure out how to get it to you.

Kevin Savetz: I think we beat it up to death.

Braddlee: Yeah. And about five people have left, so I have a feeling that maybe it's the time, but maybe servers aren't...

Kevin Savetz: Right.

Braddlee: I don't know, but that was the FTP Demon. There is a product, if you want to do mailing lists, there's a commercial product called List Star. It's from Star Nine.

Kevin Savetz: Which is the same people that do Web Star.

Braddlee: It's the same people who do Web Star. And I have not used it. I understand it's a very powerful mailing list software so if you want to have huge distribution lists you can do that with the Macintosh as well.

Kevin Savetz: Yeah.

Braddlee: For Web serving, we were... there's nothing to see. It's really dull to look at. There is Mac Web which is the freeware Web server for Macintosh. And then there is a more robust commercial one called Web Star which is from Star Nine.

Kevin Savetz: Mac HTTP.

Braddlee: Mac HTTP, I'm sorry. Not Mac Web. Yeah, and basically the Mac Web and Web Star are the same interface. They're the same software as far as the interface. It's just the code has been rewritten by the Star Nine people.

It runs about four times faster than the free version., that has been part of the primary consideration, the primary criticism of the Mac Web server software was that it wasn't as fast and they've addressed a lot of that concern.

It's three o'clock, do we want to take a five minute break?

Kevin Savetz: Yeah. Why don't we... let's take a five minute break and then reconnoiter and touch on some final things. We'll talk briefly about Newsnet and Newsreaders, although we cannot demonstrate any of them.

And then we'll just open the floor to whatever questions and finish up.

Braddlee: So a five minute break.

[Break]

Braddlee: One thing too, is that we're kind of basing what we're talking about on our assumptions of what you guys are going to be interested in. And if we're completely off-base feel free to say hey what about this, what about that.

M: [Inaudible]

Braddlee: Okay. Well we were going to talk about Java and that will go fast. I suppose if you've been awake during the show you've heard at least something about Java which is a tool, actually it's a programming language that will let you... will make the Web even cooler because you can download little applets, little programs that do things., put dancing bears on the screen or the Energizer bunny or things can happen, play sounds, and nobody's really sure what Java is going to be able to do yet but everyone seems to think it's a nice idea.

There are currently no... do you like my extension? Yeah, I've got one or two. There are currently no Java clients, such as HotJava on the Macintosh. Coming real soon now, likely within a month, you're going to see some Betas that are going to probably, maybe possibly work.

Kevin Savetz: Do cute dumb things.

Braddlee: Do cute dumb things. They exist for Windows and so they should probably come out for Mac relatively soon.

We're doing the microphone dance over here.

Kevin Savetz: There we go.

Braddlee: So in answer [to] what Java is, there's no Java client and therefore there is no Java editor for Macintosh either.

I know nothing about the language and frankly, I don't know what [a] Java editor would look like. As for other authoring tools, if you want a commercial HTML authoring tool, there is one that just came out with a new version 2.0 and it is called... it is by Softquad...

Kevin Savetz: Right.

Braddlee: And it's called...

Kevin Savetz: I'm blocking as well.

Braddlee: It's by Softquad and it's a... I guess a fairly nice HTML editor. Frankly, I'm a purist, I use *Teach Text* to edit all my HTML. And you should too because if you do that, I promise you, you will know HTML. And when you are forced to edit your Web page on the fly, you don't have the editor, you'll know how to.

And editors are kind of nice but they're not a necessity. There are a lot of, I guess you could just say, there are a lot of shareware and free HTML editors. I have tried them all and they are all garbage. And that's why I use just *Teach Text* for Microsoft Word because this one can't do Netscape style lists and this one can't do... doesn't know how to center, and this other one just crashes every third time I use it.

And I have no patience for that sort of garbage so I do it all by hand because it's all up here.

We talked earlier how Netscape has been very aggressive about advancing HTML codes and how the other browsers have kind of lagged behind it. Well, the HTML editors suffer from the same problem.

Kevin Savetz: Right.

Braddlee: If there's something really cool that you want to do that you're seeing being done with Netscape and prototype HTML 3.0 stuff, you're going to have to write it yourself anyway.

Kevin Savetz: Yeah.

M: [Inaudible]

Braddlee: Yeah, and it's kind of nice because you can see it larger., sometimes it bumps up the size. It's kind of fun. If you find it useful, great but...

Kevin Savetz: Or a good *Gopher* can get the HTML extensions for edit.

Braddlee: Yeah, and you can get extensions for Microsoft Word, *BBEdit* and I just started to help you do HTML as well. Yes sir?

M: They just came up with Navisoft?

Braddlee: Navisoft?

Kevin Savetz: Navisoft. Yeah that's the one that we were... that's the one that we couldn't remember the name of.

Braddlee: No, actually I think that Softquad is the company and the one we were talking about.

Kevin Savetz: Oh okay. I'm sorry.

Braddlee: Navisoft is a different company. Do you know what it's called?

M: [Inaudible]

Braddlee: Okay. Navisoft is available on America Online for free.

M: [Inaudible]

Braddlee: So as far as authoring tools it's HTML and nothing else. You can't do Java, you can't do VRML at this time either. Again, like Java and VRML, real soon now, but not quite.

M: [Inaudible]

Braddlee: No. And I believe you'll see those really soon, like maybe within the next couple of weeks.

Kevin Savetz: Like I'm surprised we didn't see any here.

Braddlee: Yeah. I was really kind of expecting to see some Betas on the show floor. I used VRML on Windows for the first time a couple of weeks ago and it was kind of cool. And actually there were, like, five different VRML clients out for Windows. So it's prime-time for there to be at least one on Macintosh.

M: [Inaudible]

Kevin Savetz: I was using a Pentium 75, so not the fastest machine out there, and it was smooth. It was wire frame, but it was smooth. I didn't feel slow and clunky at all. It was kind of nice.

M: [Inaudible]

Kevin Savetz: Well when you're... at least the way it is on Windows, you... it's like a Web page where it will sort... you download the information and then your computer is kind of in control of it so basically if it's a short VRML script, you've got to load a 10 or 15K script and then you can cruise around it all you want. It's not using your Internet connection.

If you're downloading a very detailed area... I downloaded one which was like 200K, you're downloading a 200K file and then your Internet connection is done and then you navigate around it.

So, once it's there, even off line you can cruise around that script and look at your information. Also, in my opinion, it was fun. It wasn't useful though, it was just like...

Braddlee: It's kind of like *Gopher VR*.

Kevin Savetz: It's like *Gopher VR*, I guess, there's another... there is something called Walk Through or Walk Around or something on the Macintosh, I don't remember. Basically you've got a scene and you can walk through it and you can see some pretty pictures but... so it's fun but it's not useful. It's not like you can go into one area and it will bring up a different Web page or something.

It's just kind of like walking through a still picture. And they were... and it was kind of clunky and VR Mail is also evolving standards. I'm sure that will get better too, but the graphics weren't really elegant.

Okay. Any more questions at this point?

Somebody had asked about... talking about Webs, about FTP or Web servers, about what you needed actually as far as an Internet connection goes, as far as Internet connection and what kind of Macintosh. Does anybody care? Or was it just the one guy?

Okay. Well, enough of you care that I'll talk briefly about it.

The gentleman wanted to know if his 28.8 connection was enough to set up a Web server, an FTP server. Basically, for personal use, I think you can get away with 28.8, but if you want any real usage probably not. And I'll explain why.

28.8 modems are relatively cheap and modem Internet service is cheap, but if you make a shareware program and you put it up and make it available via FTP on your Macintosh connected to your ISP 28.8 line, one person logs in to get your shareware program. He has... he or she has full, if you use this term suckage, he has full suckage at 28.8. And he has the full attention of your modem.

If two simultaneous users come to try to come in, they have 14.4 each available to them. Not so bad. If four people come in, they each have about 7,000 bits per second available to them. Now this is only four people coming to one FTP site, and that is completely not acceptable speed unless you have the patience of a Saint.

Braddlee: Or you're a Mac commercial unit provider.

Kevin Savetz: Or right... you're certain Internet providers that are not so reputable.

But for personal use or it it's just you and your buddy getting files... like Braddlee can go in and get his *PowerPoint* documents, that's doable, but if you want anything, to do any real work then you're going to have to get a faster connection.

For most of us, in most areas, and this is not true across the board, it depends on where you are, the next... the cheapest way to go for faster connections is ISDN, Integrated Services Digital Network. And that's a way that you can get a connection at 56 kilobits per second or 128 kilobits per second through the Internet.

ISDN costs more on a couple of the levels. First of all, it doesn't work with a normal modem, an analog modem. You need a digital device called an ISDN router. Depending on how you set things up, you may need some Internet on your computer as well.

On the second level, you need an Internet service provider that accepts ISDN connections. They probably charge more for ISDN connections than normal analog modem connections.

Nominal costs for setting up ISDN, as far as the hardware goes, \$700 for a Nubus card that you slap inside your Mac, plug your ISDN digital phone line into it, and set up some software and you're on your way.

If you want to do it right, it will cost you... I mean that's not wrong, but if you want to do it better, it will cost you more. If you have a small office or a home office as I do, I have a home office. I have three computers and I wanted them all to be on ISDN, so I have an ISDN router from Ascend which is not a Nubus card. It looks like kind of a modem. It's an external box. The sucker cost \$1,400. And I had to buy Ethernet cards for my Mac and also for my Pentium, my lovely little PowerBook already has Ethernet, so I have Ethernet between my machines. They're all connected by Ethernet to the ISDN router.

Braddlee: Do you want to explain, maybe for just a second, what the advantages of stuff like the Ascend router are over like getting like a small [inaudible] or like the configuration stuff?

Kevin Savetz: Frankly, I did it because I heard good things about Ascend and if you have insight into that...

Braddlee: No, I... since you actually set one up because basically it's my understanding that one of the advantages of the Ascend router is that it's much more... configuring routers and setting up and configuring routers presents a lot of technical and security issues.

Kevin Savetz: Setting up a router, no matter what brand you get, is a lot more difficult than plugging in a modem and typing in ATDT. You have to set a lot of the stuff like in MacTCP, only a little bit more complicated.

Braddlee: Of course.

Kevin Savetz: I like the Ascend router very much but there are routers by... I've seen routers by Cisco and Livingston and I am not an expert in ISDN, I'm just a user. So in my particular situation, I have this router which I have set up and when I sit down at any of my three machines and I run Netscape or try to check my e-mail, it rings up the ISDN connection very quickly. It comes up within three seconds. I have my connection, and I start cruising the Internet.

When I don't use my connection for a period of time... a specified period of time, it quietly shuts down. It feels to me like I have a full-time Internet connection. I can sit down at any of my three machines, punch up Netscape, pull the URL and I'm up and it's really fast. It's almost as fast as what we're seeing up here. So that's very nice.

If I had three arms, I could be at all three machines at once and they would be sharing that, which is really nice. But that's expensive and the total cost for my set up was about \$2,000. My ISP for a full-time ISDN with unlimited use charges \$150 or \$200 a month, so that's pretty expensive compared to \$20 for twenty hours for a normal analog connection.

And finally, your phone company charges more for ISDN than for an analog line. If you have normal analog service, you pay X dollars a month and you can talk for as long as you want at a local call. With PacBell over in California, they charge measured rate for ISDN which is a penny a minute which isn't expensive, but it adds up if you're going to be logged in a whole lot.

Other phone companies do it differently. And some have measured rates which are more than others. And some, I believe, have unlimited use but I believe that's kind of rare. ISDN is not available in all areas. But if it is, it's quite nifty.

So ISDN, back to the server thing, ISDN can handle several people at once. ISDN can probably handle ten people at full suckage downloading information which is good for a small server. If you want more than that, then you might have to go to 384K frame relay which gets really expensive and uses completely different hardware. Or if you are really big you can get a T-1 which is really, really expensive but very, very fast.

There's a question back here?

M: [Inaudible]

Kevin Savetz: If you want your own domain name? Basically if you want to have... if you want to be Braddlee.com or in Savetz.org or something like that, what do you have to do?

The organization that administers domain is called the InterNIC, <http://www.internic.net> and they're in charge of all domain names. They now charge a fee for domain names. It's \$100 for the first two years and \$50 for each additional year. It used to be free. But there's overhead in setting these things up.

So, for instance, I am savetz.com. I don't actually use it, but I have it. And you need basically to have, if you have your own domain name, it needs... there needs to be a domain server out there somewhere, a computer that knows, okay, Savetz.com well that's really 199.4.102.10.

Generally, if you have an ISDN connection for instance, your ISP will, for a fee, be your domain name user. Somebody has to be and if you're lucky you can maybe find someone who will do it for you for free. If you're not lucky, someone will charge you for it which shouldn't be more than twenty bucks a month. I mean, that's maximum.

Braddlee: Yeah.

Kevin Savetz: Most ISPs I know of charge a \$50 set up fee for domain service and maybe \$5 a year for maintenance. So you need someone to be your domain name server, and other than that, there's no big mystery to it except filling out the forms and doing it three times because the Internet will keep sending it back because you keep doing it wrong.

Yes?

M: [Inaudible]. Do you get through the e-mail software or do you have to go back to your ISP?

Kevin Savetz: Their own host name or their own e-mail address?

Braddlee: Their own host name or their own e-mail address?

M: Their own e-mail address?

Kevin Savetz: That would just be something in the e-mail server's software that you are running. I can't think of a Macintosh analogy, but for instance on UNIX, if you... at northcoast.com there are, if there were ten users and you want to add five more e-mail addresses, you just create five more UNIX accounts and there are e-mail addresses that would go with them.

That doesn't involve the Internet, that just involves your host computer, whatever you're using for mail.

M: [Inaudible]

Braddlee: You brought it up, you answer the question.

Kevin Savetz: How do you have a shared resource allocation using Macintosh?

Braddlee: Oh, I don't know for sure [how] to set up in DNS. I know that it is possible because we've done it. I don't know if the Mac DNS will handle that or not. I think actually it does because the folks that I was talking to about it the other day were... the context in which we were discussing it made it sound pretty clear that what they were referring to... that they were using the Mac DNS.

And really when it's a random assignment, it's just a line in the configuration that says...

Kevin Savetz: Pick a number from one to ten?

Braddlee: Right. The first one goes here, the second one goes here.

Kevin Savetz: There's a mailing list that... for people who run Macintosh servers. And I should have but didn't think of it until just now, and if you want to join the mailing list and you can't find it, send me e-mail and I will...

Braddlee: Lets... we'll put it on the list.

Kevin Savetz: In fact, we'll put it on the list, on the URL. Basically it's a mailing list where all people are discussing all sorts of these things about running Macintosh servers and some of these odd, obscure questions.

We have half an hour. We can certainly keep taking questions or we can talk about PGP which isn't an Internet tool per say, but it is increasingly used on the Internet for privacy. We can go either way or we can all go home.

Braddlee: You had your hand up. Why don't you just fire away.

M: [Inaudible] what do you do for a Web server? Is that happening?

Kevin Savetz: That only has to be in DNS. So if you want to be food.com and you want to have www.food.com as one of your hosts, all that has to do is be set up with a domain name.

Braddlee: That's something that's done. Since you're food.com you have complete control over food.com so you set up in your own domain name server.

M: Okay. So no one else can ever have a Web server with that name because you've already got that name?

Kevin Savetz: Because you've got the food.com or whatever. So if you have a Class C address with a small number of addresses, 256 addresses, you can assign those 256 within whoever-you-are.com and however you choose and give them whatever name you want.

You can change them. You don't have to talk to the Internet about it. So that's your address, space. You can assign hosts within those two top... that top level domain and the sub-domain however you choose.

And you can make for example, the same computer can be...

Braddlee: Multiple names.

Kevin Savetz: ... gopher.u.com www.u.com, news.u.com anything of those services that you're providing on that, you can add those names as aliases in the domain service to that particular address.

M: [Inaudible] services. Lets say you're just going to get like a fractional T-1 dedicated line on one of your providers so you're going to want a domain name server [inaudible] what is there available for mail?

Kevin Savetz: There's a commercial mail product.

Braddlee: Is there?

Kevin Savetz: Yes. It's new.

Braddlee: Tell me about it.

Kevin Savetz: But I can't remember the name of it, if you give me your card or I'll give you my card, I will find the name of it for you.

Braddlee: And we'll put in on the Web page after we...

Kevin Savetz: Well I don't know if it's... it's commercial. I don't know if it's going to be FTP-able or even if there's even going to be a Web page for it. But there is, just recently, because one of my friends who is a graduate student, he has this obsession in life which is to set up a fully Macintosh Internet provider. And he was struck with glee when the mail software came out about a month or two ago because that [was the] kind of piece that he was missing.

It seemed from what I remember reading at the time about it that it was real mail software that it was... it would be equal to, like, to Windows NT, SMTP, the software that's available. That it was industrial... it was industrial mail software.

M: [Inaudible]

Kevin Savetz: Is the subject?

M: [Inaudible]

Kevin Savetz: Oh I see what you're saying. Okay. Well, let's dive into that and we'll talk about that as we go through.

M: [Inaudible]

Kevin Savetz: Okay. The subject header is the mail. It goes out. The simple answer to that is no because that's not encrypted.

M: Well, you've got to be careful about what you say.

Kevin Savetz: Sure. And there is... as a matter of fact, you may even want to do some other things to obscure the fact that it's encrypted. It depends on how paranoid you are.

It looks like we're going to talk about PGP for a couple minutes.

Braddlee: Go ahead.

Kevin Savetz: Okay. PGP is, hey guess what?

Braddlee: No, it's... you were just there. Oh, I just couldn't find it. Okay. PGP, this is the text version of the telephone software that we were talking about earlier. This is for encrypting your e-mail and your files. So for example, a couple of ways that we're starting to use this. We

have a number of researchers on our campus who do work with human subjects meaning that they collect data about real living people with real names and real habits such as alcoholism.

They work in a national context. They need to be able to exchange this information across the Internet, either by FTP or as electronic mail. Because they have a responsibility to the people that they're collecting data from, to protect their privacy, this is one of the tools that we're actually suggesting that they use to do this.

Now, that's one example. Another example may be you work for a company. You want to exchange information about your research and development stuff across the Internet. Or you want to exchange details of contracts across the Internet, pricing figures, all this kind of stuff.

You want to be sure that other people are not going to be able to intercept and read that. Sending e-mail on the Internet is quite similar to sending all of your correspondence on postcards. Anybody who sees that mail going past on the wire or if it bounces and gets put in somebody's mailbox by accident, it is going to be... they can read it. You have no protection against their being able to read the contents of messages. That's one of the problems of teaching [T-addresses].

Another issue, which is also becoming important for business is the issue of digital signatures. Digital signatures allow you to certify, using encryption, that the individual who is sending a message or sending you a contract or sending you a price list is actually the person that they purport to be and that that document has not been forged or altered.

So those are a couple of basic things that PGP can be used for. As we were mentioning with *PGP Phone*, PGP works as public key cryptography which means that you have two components that you use to encrypt and send the message, one of which is a public key that I can give away to anybody on the Internet anywhere, anytime.

As a matter of fact, let me see if I can do this, what I do is I leave my public key for PGP up in the Finger information on the UNIX host so that... and this, by the way, is a Mac Finger client. And there we go, that... my information, my Finger information, for some reason it's showing it twice. We won't worry about that, but right here is my PGP public key.

Okay. So I can take this... this is available to anybody. And it has a beginning field and an ending field, the begin PGP public key block, the end PGP public key block. All that gibberish in between is my public key. What happens to anybody on the Internet or anybody who has access to this when I give this to, can use this as a tool to encrypt or sign something headed towards me.

So, if I go back into PGP and PGP was originally written for DOS, and through this current version which is 2.6.2 the port to Mac is fairly crude. It's actually better and easier to use I think than the Windows version, but it's still pretty rough.

Version 3.0 which is coming up probably in the next couple of months will be much more graphical, being completely rewritten for a graphical user interface, both Macs and for Windows.

So let's say I want to send somebody something. So I use the encrypting sign which means I'm going to do both functions... two functions. I'm going to encrypt something and I'm also going to sign. We're going to steal something off of Kevin's drive.

Kevin Savetz: We'll go into... well does it have to be a text file?

Braddlee: No, it doesn't have to be a text file.

Kevin Savetz: All right. I'll go into docs and grab a random article that's signed.

Braddlee: Pick a year and it can be a... pick a FAQ. Yeah.

Kevin Savetz: Sure. It's huge, but that's fine.

Braddlee: Take that file. That's fine. They're just text files. Okay. Now this will work both with text and binary files, so for example, didn't find your secret. Oh sure. I know where it is. It's over there.

Hang on. This is going to take a second. I bet it's not going to be simple either. The secret key is in a different folder. I know where the public key is but not the secret keys.

Kevin Savetz: Yeah.

Braddlee: Sorry about that.

Kevin Savetz: So you feed it a text file that's produced in a word processor?

Braddlee: That's right. You give it your public and your private key information and it encodes it. It creates a separate file which is unreadable to you. As an option, you can have it delete the original if you want, so you can make it secure. And then you have this encrypted file which you can either keep on your hard disk or you can e-mail it to somebody. It can be a text file or it could be a binary file or whatnot.

And then if you send it to somebody else, then they need... if they have your public key, and they have their private key, then they can then decrypt that message and look at it on their system.

We're going to try to demonstrate that.

Kevin Savetz: And feel free to keep talking.

Braddlee: I will.

M: [Inaudible]... conversation between a real estate broker and a bank [inaudible] was encrypted, can they force the people to deencrypt?

Braddlee: If e-mail is encrypted, can a court force... can it be either... can the court force them to deencrypt it or can they just do it?

First of all, regarding general non-encrypted e-mail traveling over the Internet, it is very easy for someone with a court order or just even a nosy system administrator or a company that wants to check their e-mail to read all your e-mail that you haven't read yet or the stuff that you saved. Really easy. Stuff that is encrypted, however, PGP gives you several... you can give it a light encryption, you can give it a medium or a heavy dose of encryption.

If you give it the medium or the heavy doses... I don't know what it's called, it is impossible for anyone to decrypt it. The court can probably throw you in jail for the rest of your life if you don't type in your secret password and decrypt it for them, but they can't do it. There's absolutely no way that they can decrypt information behind your back without your code... without your private key.

Kevin Savetz: However, they can subpoena your private key, and one of the reasons that Mac PGP, the new version of it will have two secret keys will be that there will be one that you will use for signing things and one that you will use for encrypting things. That way, if for some

reason the one that you use for encrypting things has to become compromised, for example, because something was subpoenaed, then you would still be able to continue to sign things using the same secret key and not have to change your keys.

One of the big problems about this is key management. Giving people your keys, getting people's keys from them, finding out whether the keys that you have are real or invalid.

Braddlee: There's some key surfers on the Internet too.

Kevin Savetz: Right.

Braddlee: So if you want to send private e-mail to Braddlee but you don't know what his key is, you can go to the server and search it and see if he has registered himself.

Kevin Savetz: Yeah.

Braddlee: And if so, you can then find him and send him private mail.

Okay. So we're going to try this again. I think this has to do with the fact that I'm trying to run this on a floppy and it's just not very happy with me.

Kevin Savetz: Anyway, it would work really well. But honestly, it's not... this is a program that is not real polished as Braddlee said.

Braddlee: Yeah.

Kevin Savetz: And it takes a little bit of tweeking to get it running the first time. But once it does, and assuming you're not trying to use it on someone else's machine...

Braddlee: Right. It's like I can do this over here very easily but this one won't plug into the video. I use it all the time over here, however. It works. Trying a floppy, I apologize.

Kevin Savetz: So basically that's PGP, not an Internet tool but useful for private communications on and off the Internet.

Any questions about PGP or anything else? Pretty much our canned spiel is done so we can pretty much go in any direction at this point.

You have us for another fifteen more minutes of unbridled Internet joy.

Braddlee: There are a couple of other things that we haven't really talked about. If anyone is interested in a relay... an Internet relay chat, there's a program called *Homer*.

I have to admit that IRC isn't really one of the things in life that I find especially useful. It's generally speaking, a lot of people sort of saying "Hi, how are you?"

Kevin Savetz: "Are you male or female?"

Braddlee: Yeah. "And can you prove it to me?"

But IRC is a very nice IRC client. There's a URL for it there. It does some neat tricks including it provides support for speech manager which means it will do text to speech translations. So if you're familiar with the Marvin and Marly voices from Mac AVs, you get to have Marvin and Marly voices for your IRC so you can actually "hear" the people who are typing at you.

It also supports a faces database which means that it uses some of the lower-level IRC stuff to move an image so that you can have an icon or a photograph of yourself up along with the other things on the IRC channel.

That's not interoperable with other IRC clients other than *Homer* because it uses some stuff that's basically code written, customer code written for *Homer*.

But if you like IRC, that's pretty much, I would say, the only client...

Kevin Savetz: Yeah. There was *Uncle Orde* for a while but it's not nearly as nice. Other random tools... I think I have it here. There's a program called *MacWeather* which is a nice little interface to the Weather Underground that we were looking at earlier.

This just kind of Macifies it and gives you just the weather information is just about any city that you can name. It's going to open the connection. It tells you the wind speed and the barometer and the temperature anywhere.

Here's the temperature in San Jose and the wind speed and for some reason it couldn't get the barometer information so it leaves that blank. And we can change the location. I don't know... lets get... state, lets pick some place. Might as well pick Boston. It's going to get something weird, but I got uncreative at the last minute there.

Now it will update it and we'll find out if it's raining in Boston.

Braddlee: There we go.

Kevin Savetz: Yeah, it is.

Braddlee: Hey.

Kevin Savetz: So it's a cute little thing. You would have an update every ten minutes or something if you want to track the weather. And yeah, you can also [see] the forecast... where is that.

And so you can get a text forecast, and this is the same stuff that your weatherman uses on the radio. Tonight rain, drizzle and fog, low 45 to 50, wind east 10 to 15 miles per hour, chance or rain 90%.

So that's *MacWeather*. It's in the handout and it's a fun little quickie program.

Braddlee: And as far as Usenet, news readers?

Kevin Savetz: Oh yeah, we kind of...

Braddlee: There's a problem with that which is that because news is something that usually your Internet service provider provides to you as a service. It's not the kind of thing that you can go out and like look at anybody's news server. Because this is a temporary network, the news is not something that they're providing locally.

And they're not really able to serve half the news server to provide news to this IP, so that makes using that software a little bit limited.

Kevin Savetz: There are three good newsnet news readers for Macintosh. My favorite is called *Newswatcher*, it's freeware. The URL is in the handout.

At the last show, we showed off *Newswatcher* and you liked the one called *Internews*.

Braddlee: *Internews*. Yeah.

Kevin Savetz: And we fought over which one was better. I used his for like three months and then went back to *Newswatcher*, so I guess I'm not a big convert. So *Internews* and *Newswatcher* are our two favorites. And if you need to use Newsnet news, download them both and try them out.

Braddlee: Yeah. *Internews* is slightly Eudora-like in terms of how it lays things out. And I like it because it's very flexible in the things that it allows you to do. There are a couple things about it that are a little bit clunky as far as how it indexes news groups. There are a couple of things that *Newswatcher*, *Internews* does when you first set it up. It can be surprisingly slow. But once it's up and running, I kind of like it.

And there's another one called *NCS* that a lot of people like. I've never been particularly in love with it and I gather it leaves you...

Kevin Savetz: Me neither.

Braddlee: ... as well, but other people swear by it. And all three are listed in the handout.

Kevin Savetz: I think we are done. If you have any more questions, feel free to come up. Thank you for coming and have a safe trip home.

TUTORIAL LOCAL BUSINESS WEBS



SPEAKER

R. Taylor Walsh

Washington Information Services

R. Taylor Walsh: [I'd like to welcome everyone to this session. The organization that I work for is called Washington Information Services,] which means it was designed to serve the public service enterprise across the metropolitan Washington area. It started in 1993, before there was a WorldWide Web; but [once] we started in 1993, basically schools, libraries, and local governments all got on-line. You're probably aware of organizations like mine elsewhere around the country; there are 250 or so around the country that are in formation or operation. In any case, many of these community networks have formed the basis of what we see happening now in the metropolitan areas on the WorldWide Web. We'll take a look at a few of them in just a minute.

What I wanted to do today — and I don't think we're going to take the 2 1/2 hours allotted this morning — but I want to give you an overview of the landscape of metropolitan area networks and what's happening there, and some of the trends and some of the forces that are in play right now. The whole local enterprise is changing dramatically, as we'll see. It's funny, because local areas, and local businesses in particular, have been the last holdouts as far as wanting to go forward and consider on-line services, whether it's the Web or anything else, as anything they would spend their time tending to or considering.

As the on-line services have grown over the last decade or so, local markets have been pretty much quiet in terms of a local business making itself available or making its information available; and I think you see that the WorldWide Web, just like it has for business in general, has now energized local businesses and local organizations.

We're now seeing a rapid deployment of WorldWide Web sites in metropolitan areas. In fact, if you go out on the Web — as we'll do when we go around — you'll see that the speed with which this is happening is truly astonishing. The number of businesses and the number of organizations who are trying to stimulate the appearance of businesses on the Web in local markets has gone up very quickly, very quickly indeed.

The background for all of this is that, oddly enough, when on-line services and electronic information services first appeared, when there were the first endeavors by big media companies and telecommunications companies to try to put local businesses on-line. You have to go back to the late '70s and 1980 when [Viewtron], which was a Knight-Ridder and AT&T project in Florida, tried to do this, and Gateway, which is out in Los Angeles, [also tried it] when the Times Mirror Company put together a local service. And these services not only tied up your telephone, they tied up your TV at the same time.

They didn't work, and because they didn't work and because so much money was put into them the newspaper industry in particular, which had been looking at the Knight-Ridder and the Times Mirror experiments, basically were terrorized for at least a decade in terms of what they wanted to do in getting into on-line services. And newspapers, of course — when you talk about a venue for business in a local market, the newspaper has always been, along with the Yellow Pages, a prime venue for businesses to get their marketing messages out — along with television, of course.

But the wide, broad, regional story of any community has been woven together, in many instances, primarily by the newspapers. In the newspaper business, the list of trends shows that newspapers are coming back into the on-line service world. They're using America Online or

Prodigy, or they have CompuServe in the last couple of years, and now they're also moving into their own Web server space for the same reason that other publishers have also decided to deploy WorldWide Web sites — because they can control the contents, and the look and feel and the relationship with the reader or subscriber, as opposed to using America Online or CompuServe. They control the look and feel, they control the space.

There's a huge dichotomy there. If you're a publisher you want to control all your relationships; however, America Online, for instance, has four million subscribers who know how to use a modem, and that means if you have a newspaper you don't have to teach those people how to use a modem to get to your stuff.

But that has all changed dramatically in the last year. In addition [to what I said earlier] on the background, the first bad experience that newspapers and big media companies had [was in the early '80s,] so they basically went away. In the meantime, what we saw were a number of factors that have taken us to this stage today, when we're talking about businesses and local markets having been reluctant to put anything on-line. Few have done anything even as extreme as open up a bulletin board.

You know, a technology company might have had a bulletin board where you could in to get information about services. [There were] other factors at work through the '80s which have brought us to this point [today], where the Web is not just a visually-pleasing place to put your stuff. You also have an enormous marketplace out there right now that is ready to take advantage of it, but only because in the last ten or twelve years the work of the on-line services companies have given people — individual users — a place to learn about this medium.

Bulletin boards... Certainly, in local markets, the local bulletin board community was really the first incubator for a lot of this experience. And, of course, in the early days technology was primarily PC-based, so [bulletin boards were] oriented to technology and were not connected to anything else very much unless there were networks of bulletin boards. Simple, stand-alone, one to four line bulletin boards were connected in some networks like FidoNet, which was a network of bulletin boards and educationally related bulletin boards.

So you had a very rickety infrastructure in the '80s that began to take shape. The local bulletin boards had people who used America Online or CompuServe or Thesaurus, which was the first national on-line service. which is where I got my start. I was there for six years in the early '80s. These are the companies that provided a way for people with PCs and modems to get into this business; and everybody, of course, was working from home or from their business in some local area.

And at the same time the Internet, of course, in its rendition as a research and education infrastructure, was also emerging in the early and mid-'80s, serving a very defined group of communities — but again, building a user base of people who would eventually become able to use any kind of resource on the Web or the Internet. And then in the mid-'80s you also had the emergence of community networks.

Now, I've put a little time chart together — I think it's the last page on this handout — that shows you, in general, a timeline of various events that have taken place up to now. You see we talked about local bulletin boards over on the left there, and about the 1980s time frame, and the appearance of the early on-line services; then up above the line the community networks. In about 1985, the first community networks started to appear.

Community networks were different from bulletin boards that might have been devoted to a Mac-user group in a town, or a PC-user group, or a Dungeons and Dragons role-playing group or whatever. The community network was designed from the outset to encompass the entire region or an entire metropolitan area's region. Cleveland was one of the very first, [with] Cleveland FreeNet. Before that [there was] the Santa Monica Public Electronic Network. We had a handful in this time frame. Colorado Springs had Dave Hughes with his network, and

those were bulletin boards in the sense that they were either DOS or UNIX-based bulletin boards designed to give local governments and teachers and schools a place to go, to begin. They were designed specifically for that purpose, and since 1985 there are, as I said, a couple hundred, 300 in formation around the country.

Now they are all part of what is now, in any metropolitan area, a much broader, much more interconnected web — not world-wide, but a local web. And when we put CapAccess together in 1992, at that point local dialogue on the Internet was basically non-existent. There really wasn't any. PSI and UUNet were coming along, offering some kind of dial-up service, but the WorldWide Web was nowhere in sight.

One of the things the community networks did, one of the points of connection that was made, was in about 1990 when the Internet itself became the focal point of what has turned out to be the National Information Infrastructure, and [also] today [with] the federal government's program to develop a National Information Infrastructure and put funding behind it — at least so far as they don't put the Department of Commerce out of business, which might happen. Basically, Senator Gore, when he was in the Congress, pushed for the development of this National Information Infrastructure, building on the networking that was already in place in the Department of Defense, the Department of Energy, NASA and the National Science Foundation — the federal Internet. The Internet's roots, as you all know, go back into that collection of interconnected networks.

What Gore did was extend it and say that we need to give schools access to these resources, that we need to give the public a bit more access. Now, the Science Committee, just as a small diversion, didn't realize in the late '80s that it wanted a national research network, and they didn't particularly want a national research education network. However, when this initiative was launched and passed by the Congress it energized all these teachers and school people and very, very special librarians in the public sector who had been on-line for eight or ten years, who knew that their world was going to change dramatically. And because that was so, they raised hell with the federal agencies and said, "Hey, we want to be part of designing and developing this research network and education network, so let us in."

And the science guys said, "No, go away." But the net effect was that the influence of the public sector expressed itself many times in these early community networks that were locally oriented and all interconnected to the Internet, because, in general, the home for their technology and some of those districts were local universities that gave their services in time shares, technologies or Internet links. I can speak from our experience at CapAccess in Washington — George Washington University was the entity in our area, and the institution that made possible this little collection of organizations to get going.

So you had this convergence, you had this Internet growing up and you had the users of bulletin boards and on-line services sort of colliding in the late '80s to 1990, and converging with one another. The forces that encouraged the development of community networks were pretty much secured, and enough of the cost of the technology had come down and anybody thought that if they could run a UNIX bulletin board on a 486 with a few phone lines they'd be in business. It's a little bit more complicated than that.

Now, if you follow what's happened in the last couple of years, particularly in the last six months, even if we just look in our neck of the woods in the Washington D.C. area, the change is pretty profound. WETA is the largest public broadcasting entity in the Washington area, and it has radio and TV, and they produced *The Civil War* and *Baseball* and other stuff that I'm sure you've seen on [public] television. In September they acquired CapAccess, becoming the largest public broadcaster to have a community network in-house. They have a radio station, a TV station, and they've got a community network.

Other local public broadcasters, including WGBH here in Boston and elsewhere around the country, have been looking at community networking and trying to break their own paradigms about what business they're in, in part because of the Department of Commerce's programs to fund community networks — they are more and more involved all the time, and the local public broadcasters are more involved. You'll see more of this at the federal level. The Corporation for Public Broadcasting and PBS have been developing their own Web sites and their own on-line service capabilities. There's such a thing as "PBS On-line" out here in the world, and the importance of this is that the community network, the nature of networking, and the interaction between citizens and among groups and institutions that characterize community networks now comes into the public broadcasting infrastructure.

And what it does is a couple of things. CapAccess, in the two years of its little rickety start-up period, was able to offer not very great technology; it was a UNIX dial-up bulletin board primarily delivering information in ASCII text format. We could have gone to the Web directly, but we didn't. Why? Because there were a lot of people out there, oddly enough, with Commodore 64's and 1200 baud modems, and they're still there, and as a principle of operation we said, "As many community networks have done around the country, we have to be able to serve those people whatever they happen to have."

So you see, as a result some of the late developing community networks such as LibertyNet in Philadelphia and a couple in Virginia, that they've decided to put everything into the Web format, and if it's text then to go with links — which, of course, is the text rendition of Web-formatted material. CapAccess got started before the Web was even a mote in a network of God's eye. It was burdened, if you will, by this text presentation style, but there is a Web site that CapAccess has put together, and this is kind of a prototype; it's not very exciting, because why would you spend much time on it? It will change dramatically in the next six months.

In 1995, in September, WETA acquired this resource; and what it is more than a resource, it's a new way of connecting in the community. Public broadcasters like WETA will now have a relationship with the public sector, with local schools, libraries and local governments and non-profits at a level it never had before. As a broadcast medium you're not involved in helping your users invent the content and material; that's what a community network does, it provides a place for people to play. And just like any good site does, this is going to change their business in the local markets.

And, of course, the added factor to that is that public broadcasting as you probably know it is under tremendous financial strain. They're all planning on the day in two or three years when they have no more federal money at all, so they're going to be driving like crazy to do public/private partnerships in their local regions. WETA, like most long-time public broadcasting entities, has very good connections in the grant-making community and the private sector, and I think you're going to see that one of the upshots of this is [going to be] some interesting new financial arrangements and economic arrangements [that will] fall out of this. And new partnerships, too, because the underpinnings of public funding for broadcasting, to say nothing of the public libraries, is all in upheaval right now. So we have to come up with new ways to fund what has been, in the past, public media.

The other things that have happened rather quickly in our area — and though I think it's just in the Washington area, [it is] emblematic of what's going to happen elsewhere — what is happening is that the *Washington Post*, which is a big paper in Washington, has its own service up called *Digital Ink*, and America Online has launched a local service called *Digital Cities*. The first one that they've unleashed is in the Washington area, and you'd have to be an America Online subscriber right now to participate in it. They very much want to go into the

marketplace and sell advertisements to organizations in the Washington area, and then Philadelphia and Boston and wherever else they're going to do this.

And what [America Online] says to their advertisers is, "The *Washington Post* just got launched and it only has about seven or eight thousand subscribers; we at America Online have 120,000 America Online subscribers in the metropolitan Washington area." And they'll be able to say the same thing proportionately as they go to New York and elsewhere, so they're saying, "We have a leg up, we want to be the focal point for business activity in the local area."

This is getting to something which is mainly confusion in the local marketplace, but that's what America Online is doing. PSI, which is out here, is one of the fastest-growing Internet access providers. They're very aggressive Internet access providers, [and they're] launching a local service in Washington as well in the next month or two. And then, around the first of the year, Bell Atlantic, the local telephone company in the mid-Atlantic region, is going to become an Internet access provider and bundle that with — guess what — local information service.

So it's very crowded out there in the local marketplace in the Washington area. On top of that, you have other entities in the local marketplace who are working to put organizations and put businesses on-line, and serve as sort of hubs for businesses, like the *Business Yellow Pages*, and we'll see some of those in just a minute.

I think this is all for the good, and with the arrival of the phone companies one hopes it's going to mean that access to the Net is going to fall and plummet in price. You never know; but the other factor, I should say, is AT&T's personal Internet service promises to bring access when AT&T becomes another access provider — and there are apparently no legal restrictions for them becoming local access providers. And the other factor is the cable companies; they're desperately developing the means by which you could hook a modem up to your PC and hook it into your cable connection and then be on-line at 10 megabits.

And so there's a huge race by the phone companies and cable companies to high-speed access into the home and local businesses. In many places the cable companies are — and have been for several years — laying fiber along their right-of-way, [along] their traditional drops which have been in residential neighborhoods where they really placed their stuff; but now they're also moving their drops into business areas as well, because they can see that there's a tremendous opportunity to serve business customers in their region.

I think we see this in the D.C. area and I think you'll see it all over the place. The bottom line is that there are just a hell of a lot of places to get access and a hell of a lot of companies that are going to come into businesses and say that they have solutions, and the companies, I think, are going to be slightly confused. I have a little scenario there on the first page which takes a hypothetical business person through the thought processes for thinking about being involved in this WorldWide Web.

This is a guy who's got two or three audiovisual sales and repair stores, and has an AOL account because his brother told him he has to get one so that they can e-mail each other. His kids use it in school, he's heard all about this, his guys are selling computers and he needs to get on the Web someday — and he doesn't know what to do. And I think that despite what we'll see as we go around the Web and take a look at what's going on in different regions, I know from my experience in talking to people in the Washington area that there's a feeling of, "Yeah I read a lot about it," and he can't go into a bar or men's room without seeing a newspaper on the wall with the Internet all over it.

He doesn't know how that's supposed to affect him or what the benefit is for him; and for those of you who are in the development business, the local marketplace has become an opportunity, if it's done right, to help solve those problems, to help sell that person through those questions that he has, he or she has, into whether they ought to be in this infrastructure.

I think the driving thing right now is "Because everybody else is, I've got to." For some people that's sufficient motivation, but for others, because of the cost involved or because of the hidden costs that you don't count on, that could be their other factors.

M: [inaudible]

R. Taylor Walsh: Well, you better get on it.

M: [inaudible]

R. Taylor Walsh: Yes, it is. Okay, thank you. Have a good flight. Incidentally, please interrupt at any and all times.

M: I have two questions. These local community networks — are they primarily focused on providing public information to citizens and Internet access to businesses, or do they also allow businesses to advertise and sell their products and services?

R. Taylor Walsh: **Did everyone hear that question? Is the role of the community network to provide citizens access to public information, or to provide advertising in a place where businesses reside? Does that pretty much get it? The answer is that it depends on the community network and what it thinks its philosophy is and its mission is. It also depends on the financial practicalities of trying to run what were really free services offering free Internet access, as many of us who were involved in that part of this equate it as and try to do. And part of this was a philosophical approach that what we're trying to do here is replicate in cyberspace what public broadcasting and the library offered in those other media.**

You can only carry that so far, and it's not very practical to have SLIP connections for nothing; somebody has to pay. So what we've seen in the last year and a half or so is that some community networks like CapAccess have had to say, "Well, we took free access as far as we could and now we have to charge you \$25 for an account." Others have gone to a monthly fee, a sign-up charge and a monthly fee, and others are looking at a text access for one fee and Web access for another. LibertyNet in Philadelphia has decided it wants to provide space on its system and lease its space and be a service provider for everybody, even though they're a community network in the broadest sense.

Most community networks were designed for the public enterprise. LibertyNet wants to have small businesses be able to put their stuff up on the Web and be an incubator and host for that. What CapAccess is doing and what others are doing is acting as a service bureau for organizations in public service. Large county governments, library systems, school systems, and non-profits are taking their first steps into cyberspace through CapAccess, and we're charging a fee for that. When you get into this business you have to know that at some point every organization is going to have their server tucked over in a corner there at some point.

The schools are already beginning to see this. School systems are integrating their server technology in with the heat and air conditioning, as it should be — it should be part of that fabric of their infrastructure. In the meantime there are still thousands of organizations, particularly non-profit ones or large local governments, who know they've got to get into this but don't want to make the full-bore commitment of purchasing equipment and dedicating the people and all that stuff on the technology side. So a server farm, if you will, a collaborative effort which is what these community networks are, gets them going and gets them up and running.

And you see the real issue here is not so much technical; everybody says [the issue] is the people and it's true, and here's where it's true: in the back end of a local government. Let's look at the public information officer of our county government, who manages the content that appears on their site. She has a lot of work to do in dealing with people in other departments to get the information from them and get it up on-line; so what you have is [a situation where] the relationship she has had with those people, her peers in local government, that changes. The relationship that the local government has with its residents and its citizens, that changes. So internally, the staff of the organization also gets access to the Web and the Internet and all those resources, and they get to learn how to make use of those resources.

Those are all very important components of this, so it's more than just putting up information so residents can come and see what the parts schedule is for next week, which is pretty mundane and everything. So that's where the real key lies in giving those organizations a way to do that on a cost-effective basis; it's the objective of CapAccess in our case, and [also the objective of others] elsewhere around the country.

All these community networks reside in a twilight zone financially. They are serving what will come to be more; they're doing the job that local governments, libraries, etc. will pay for and integrate into their own system over time. But right now — and those entities, even though public funding for everything is really under a lot of stress right now, at least there's a traditional, financial underpinning that can make that happen. Community networks don't have that underpinning, so efforts to raise money from corporate contributors and asking people to donate money and all those things, and trying to replicate the public broadcasting model, hasn't really worked.

Public funding is drying up and contributions are very tightly under competition, so that's why you see the movement of CapAccess into the WETA structure — because that's the way it needs to go. These community networks need to find a benefactor and be incorporated into the mainstream public media.

But the important thing about them, or one of the important things about them, is that I guess 25,000 people have passed through CapAccess in the last 2 1/2 years to register as users. I think some of them have gone off and then registered with Internet access providers separately, but what they have done is — and I should say that many of these users are folks who just got a PC and a modem last week. They reflect the new category of user in all of this, the new level of the market that Steve Case of America Online is always talking about. They're interested in the next 93% of American homes that are not on-line, and that's what they want to prepare themselves for.

Well, a lot of those people are getting their first taste of this through a community network that costs them next to nothing to join, and then they get to e-mail all over the world and they use Gopher and ListServ — which are not the wonder of the Web, but they're very powerful, as anybody knows who has done this.

In terms of a local marketplace, businesses now are looking at [the question], "Should we do something because of the work of community networks, which have built up a little base of users and potential buyers or whatever?" They want them their market, because they play that very important role. All of these are interwoven together, so that's how that has been playing, and it's also, of course, in great change every day.

As we'll see, in most communities you don't have one entity; it's not — there are no entities trying to be the hub for the index, the Yahoo source for everything in their territory and their region, all about businesses or whatever it is. What you find is that there are probably a

half dozen organizations that end up playing that role, and that's fine because there are many places to go get a list of who's doing what.

I think we'll find that we're in a period right now, however, where it's still hard to find the searching capabilities. People, out of the kindness of their hearts or in the interest of building a client list, will put a list together of businesses, and it will be a list of non-linkable names — because presumably what they want to do then is take their list out to the non-linkable auto repair guy and say, "Look, you're on the Web, all you need to do to get active is to pay me to build a Web site for you." And that's fine, that's going on.

Let me just ask you all, are you here as developers? Who are developers here? Okay. Why else are you here? What are you here for, sir?

M: [inaudible]

R. Taylor Walsh: What did you come to this session hoping to find out? Anything in particular?

M: [inaudible]

R. Taylor Walsh: Ma'am?

W: [inaudible]

R. Taylor Walsh: Okay. Sir, how about you?

M: [inaudible]

R. Taylor Walsh: Okay. Sir, developer?

M: [inaudible]

R. Taylor Walsh: Really? Jones, cool. It's a big pie, and everyone should jump in and cook one.

Okay, let's take a look at some of these sites so we can see the multiplicity of uses. There are a number of places that have done a good job becoming a primary link to lots of city services around the world. CityNet, I think, has done a pretty terrific job. As you see, this is their Home Page, and they have made it a world-wide, global effort, so if we choose the United States here they've got it broken down by state.

Let's go to Oregon, and we're going to pick Portland. Now, when I first looked at this I was pretty much astonished that this many cities in Oregon had any kind of Home Page-related reference to them. Some of them are in standard Internet style — entrepreneurs out there will just put together the list, whether anybody in the city or town knows about it or not, and then just follow up.

So again, all this is under CityNet indexing and categorizing here. And so if we do the Portland, Oregon Web Directory, this is, I believe, one of these examples of a company here called Spire Communications; this is probably the Home Page, and they have put together a comprehensive — they've tried to make a comprehensive directory here of businesses in the Portland area, and of course browbeat the visitor right here by saying, "If you're not on the list you've got problems, so create your own Web site," which they will be glad to help you do. If you go through this, they probably may be just one guy, so he's going to charge you \$35 a business to set up a couple of pages.

Let's watch the text there; it tells you what he's going to do. Here's an example of a list of businesses put together by one guy in the business, not associated with anything, really, but himself. Here's another list of Portland-area businesses on the Web, and another Internet provider. And you'll see this in just about any area you go to; you're going to see a developer that takes the initiative to put together the list.

Now here, I think, this is an example of — there's no search mechanism in this thing, and in most of these city listings like this you don't find any search mechanisms. The way we [solve that is to] have a Net search locally, and I think this hasn't been done yet.

So here's Days Inn, and I also should mention that these pages sure are coming up nice and fast, aren't they? I'm told this is a 10-megabit Ethernet connection; it's maybe not that fast, but anything you guys can do to get 10 megabits to all of our wrist watches, by all means please do.

M: [inaudible]

R. Taylor Walsh: This year ends in 58 days. That this year?

M: [inaudible]

R. Taylor Walsh: In Alexandria? Alexandria, Virginia, is a suburb of Washington D.C., and for some reason it's a hotbed for development of all kinds of technologies.

M: [inaudible]

R. Taylor Walsh: So here's a vendor who — I'm not sure that Days Inn does it, but if you look up at the location site this tells us that a developer will do that and put this up on-line. I saw the corporate Days Inn also has their own site out on the Web somewhere. Okay. Yes?

M: [inaudible]

R. Taylor Walsh: Kind of reminds you of when companies were buying PCs behind the MIS guy's back and putting them into companies. I think that a lot of that still applies; I don't know, I think it depends on each organization. How is this a problem for the Royal Bank?

M: [inaudible]

R. Taylor Walsh: I think it's — from what I've seen, I have not seen a lot of violations. I think people on the Web, in the Net world and particularly on the business side, are pretty straightforward. There's always someone trying to register *exxon.com* or *gulf.com*. I think we're passing through those phases and that kind of stuff; but it is an issue, and I think it's a communications business, and if you're communicating with [people] internally then that kind of thing shouldn't be a problem. It depends on the culture of the corporation, I think. You always have entrepreneurs out there saying, "That doesn't matter, they'll figure it out later, you'll be a leader, you'll show them the way and be a champion internally." Whatever.

A subject I wanted to get to, but we might discuss it now, is of considerable importance as this goes forward, and that is the role that this structure is going to have on banking in local markets. I have a client in the Washington area that's got a bank with five or six branches — actually eight, I guess, with Baltimore — and I'm still trying to come up with a coherent explanation for him about what all this is going to mean to him as he goes forward.

And if you have got your *Quicken* and your *MacInTax* that Intuit has delivered to you along with a *Netscape* browser — they've just done a deal into Netscape — and the electronic banks are out there, some of the intermediary roles that banks play are under some kind of change. I don't know the extent to which there will be a lot of change. Have you guys looked at the relationship within Europe? I assume you're one of the largest banks in Canada.

[Tape change]

R. Taylor Walsh: [I'll] see if I can find... First Union, of course, is a major bank, particularly in the East and Southeast. They have also been very aggressive in developing this site, and they've got a service mark on cyberbanking, or so they say. What I want to click on here is this thing called "Community Commerce."

M: [inaudible]

R. Taylor Walsh: This is a time to combine root words and service marking. To me, one of the interesting things is that here is yet another entity helping other businesses get on-line, and playing the role of the place where people get on-line. The bank becomes your Internet service host — that's what it looks like they're trying to do. And extending that relationship, the bank's business relationship beyond account management and deposits, into another level, a whole different level of business relationship — that's very interesting. It's almost like whoever gets there first is the one who's going to pull away with the business, although this is such a decentralized infrastructure that we may see, in every different area, scores of organizations being able to do this.

Whether AutoNetwork or PCTravel is going to be satisfied with the way the bank does their Web service development remains to be seen. This probably is not the bank's business; I think [it's a business for] a service bureau for information or advertising or marketing stuff for clients. But anything's possible in the future, right?

W: [inaudible]

R. Taylor Walsh: Do you have fiber all over the place?

W: Working on it.

R. Taylor Walsh: Another one — I think I've got them listed as unsung entities out there or something — the power companies have got infrastructure that can be used for this. I think the key is that the bottom line of this medium is that it offers relationships, just rips them up and tears them apart and rebuilds them all over the place.

And here's an example, an AutoNetwork. If you've got to get a loan to buy a car, where will you go? To a bank, there's a way to reestablish or reaffirm relationships that make sense financially for a business in a local marketplace like this. Of course, the dealership is local because you've got to go somewhere — it's got to be on a corner on a street with an intersection, where you go buy it and pick it up. But the bank, First Union, is down in Charleston, somewhere down in North Carolina, and their operational end does not have to be in your metro area.

Now, does this compete with my friend and his bank with eight branches in between Baltimore and Washington? Does this mean he's going to have less opportunity to make auto loans as a result of this affinity relationship here? Maybe; that's the kind of thing I'm trying to

work out with him. How do you get in the way of this electronic cash stuff? It's very important in local banking's financial affairs, I think. I don't know specifically how yet, but... Yes?

M: [inaudible]

R. Taylor Walsh: If you're PCTravel? Well, you can block any links from anywhere, and you can block addresses. You can do blocking. The whole question of who gets to go where and everything is still up in the air; this is still too much in the formative stages, and I think a lot of people don't want to do a lot of blocking, they want to see what's happening and encourage this connection. But I think it's a good issue in the future.

W: [inaudible]

R. Taylor Walsh: What do you gain by blocking? Well, you could have a site that's designed really only for a specific set of people, but if somebody takes your image, that PCTravel image, and puts it on their server on their Page — which they can do — and then put a link to it, it may, I don't know... There are reasons for people to want to restrain or keep the flow into their site controlled.

M: [inaudible]

R. Taylor Walsh: Guilt by association, Net guilt. Yes sir?

M: [inaudible]

R. Taylor Walsh: There's a good question. The answer is that I don't know what the liability is in terms of links.

M: [inaudible]

R. Taylor Walsh: Well, presumably, in this case First Union has control of this Page, so they presumably know what's behind those little boards there and they know what's going on and they want their customers who come in to go there. No doubt there's probably a financial reason for them to want to direct you to these guys over here; maybe PCTravel is a big client of the bank, and they do some kind of financing of trips. Who knows?

But what that says is that you need to be vigilant if you're going to do this. I think one of the things that's often underestimated is the amount of work it takes to really run one of these things well, and how many people it takes.

Earlier this week, over at one of the other hotels, there was a two-day marketing seminar, and on one day they had the fellow who runs an ad agency called Modem Media talk about their experience in putting together a page for Zima, which is a clear alcoholic beverage that one of the brewers has put together.

And if you ever take a look at the Zima Home Page, they've done a very nice job of creating a community, which is a key to a lot of this — creating a relationship with your customers and the people in your universe. You want them to feel like they're part of whatever you're doing. And they have used a lot of techniques to really do that, really very well. They've got six to eight people who are doing that for one client, all the time. In a traditional advertising setting you may have a television production crew and producer who may produce a TV ad in

30 seconds that may take eight people three weeks to do it, but they're not doing it all the time.

So there's a dimension of support that really is just beginning to be understood as being pretty crucial. Yes?

M: [inaudible]

R. Taylor Walsh: Well, my view on that is that personal computing, with the accent on the "personal," is at the heart of all of this. I was going to start this by saying that my biases were that the Internet wins and the interactive TV loses, and that the power in all of this resides in the PC and in the server — I'm sorry, in the browser and in the server. And those components become less costly and more capable over time.

And if anything, you put power into the hands of a classroom and these kids are doing great stuff with all this stuff. And they want it; they want the control and the power to be able to tell the story of their school. That's what it amounts to. [They also want] the ability to connect with other schools around the world and do joint projects on whatever it happens to be.

That's what the Internet makes so easy and available to everybody, and why it's so powerful. You don't have to... Okay, you've got the class and the teacher's got to say, "We're going to do this project for sixth grade science essay on some subject, and we're going to join with these other schools around the world." So you've got that framework, but the phone company's not going to tell you to go there or go here. Yes, I think they're going to want to have it big time.

I was at my kids' back-to-school night a few weeks ago and they've got a great lab with a bunch of PowerMacs in it, and the parents all got in and the computer teacher was talking about this and a guy shot his hand up [and asked], "When do we get a Home Page?" Every school wants to have a Home Page, lots of classes want to have Home Pages. So it's controlling and telling the story about you and who you are and what you're part of that's the driver, and the tools are what make it possible to do that.

M: [inaudible]

R. Taylor Walsh: They just vanished? As I said, vigilance is something of a Net liberty. I know that that's not true. They've changed the address, so let's see what they have done. The Marino Institute in the D.C. area has come into being in the last year to try to play a coordinating role in the community network side of this business, and they are concerned with not just putting a school on-line or non-profit on-line, but whether or not doing so has any beneficial effect. So they're trying to provide some measure of measurement to the use of this technology in these settings. One of the things that they put together is a directory of public access networks, and I think I just put a couple of things on one of the last pages there that included the address to this site; marino.org will work. We'll get to that page we just saw, and from there even go here.

Again, we're talking about local business webs, and the role that public access networks or community networks play is going to become much more entwined in business settings. The network takes down walls that have been traditionally established institutionally and socially and every other way. So here's a little map, and you can click on the map if you want and go out to Montana — this alleged 10 megabits is great, isn't it?

Here are some community networks out in Montana. Sky Telegraph is one that's been around for a long time; it says 1988 here, but it's actually more than that. They are an outfit that has done a terrific job in getting schools — out there schools are separated by scores of

miles, and they early on traded a bulletin board network of schools that served as kind of a foundation for a Montana-wide public network. What they have also thrown in is economic development and that kind of thing, and again, [that's] very important. Frank Odaz, the guy who did this, is one of the legends of the network world because of his work in that venue; they've done a terrific job. So the Marino site is a good place to keep track of community networks and also what's going on there. There again, there's a list of them.

We'll go back a little ways. I don't know why I have the Empire State Building Web Cam, because they still have it on April, but allegedly you can see what's going on in Central Park [with that]. Let's look at [Delmarva], a fellow in Maryland [and] Virginia. That's the area down there where, in those three states, the Chesapeake Bay forms the western boundary and the Atlantic Ocean is on the east. As I recall, this particular site, which we're having trouble locating, was put up by the local television station in Salisbury, Maryland. The Delaware Shore is a place where Washington area [people] go to lay in the sun and get sunburned.

It didn't find it, so we're not going to go there... But I wanted to show that because, again, I was trying to show the different entities that take the lead role in doing these things.

We'll try to go to another town. It doesn't look good.

M: [inaudible]

R. Taylor Walsh: Yes, I'll try that. I think we're having some network problems.

There we go. Blacksburg, Virginia is down in the southwestern corner of the state of Virginia, and it is a community network, but it's kind of a special one because when it was founded, Bell Atlantic phone company, which serves the area, was a partner with Virginia Tech down there, and with the city of Blacksburg; and the idea was that the three entities would pool their resources and create this network. Now, initially it was going to be a test bed for high-speed connections, and Bell Atlantic wired a couple of apartment buildings so that you could have access from your apartment building to some high-speed information that was assembled by the university. [They also wanted to] get local merchants involved, and schools, and try to make it more expansive than simply a public enterprise. [They wanted] the entire community.

At that time the connections were only within — it was a proprietary little universe, there was no Internet connectivity, at least until about a year or so ago when everybody said they had to be connected. So they ended up making the connections necessary to get to the Net, and of course they then formed their own Home Page here. As in many cases, everywhere you go where you see a proprietary solution being offered. I mentioned the *Washington Post*, and it uses AT&T's interchange platform, which appeals to the newspaper because the newspaper keeps all the content in its own server. In traditional newspaper mentality you want everything on your own printing press and everything internal; but they've changed running to go out to the Web as well.

So here you see that they've done a very comprehensive job. If you look down this little list of components here, [you can see that] they have contributions pretty much from all corners of that part of the town. Now, Blacksburg is unique because it's so isolated — unlike the Washington, D.C. area which has got 14 counties and three states in it, and millions of people. A lot of people in towns and cities look at this. Alexandria looked at this, then went down there and they decided they wanted to do the same thing.

It's much easier to do this in a self-contained little physical area like Blacksburg than it is in Alexandria where you've got the cable company and Bell Atlantic beating up each other, trying to get the business in town, and then you've got the citizens and the local government, and the *Washington Post*, and America Online — everybody else is going crazy in the D.C. area.

Let's look at the "Village Mall," which is their index to the local businesses. Everybody in Blacksburg has better eyes than I do, apparently. Over time this is what happens, when you see these things just begin to get set up, and over time they become more robust and comprehensive. Again, the beauty of it is that this doesn't pass through one desk or one development industry, but it's like a laundromat.

M: [inaudible]

R. Taylor Walsh: Easy Way Laundromat has got a Home Page? Beam my laundry the easy way, okay. Again, in many cases it's just a text description, and you don't know whether Easy Way knows that this is there, and dialing in from where we are you don't know whether they have approved this or they even know that it's up. Presumably it is, and they've done that.

Okay, here's a store that actually does have a Page. It looks like you can buy stuff, like a consignment store or something. It's done by bnt.com. I always try to go find out who they are, so in other words you've got a wide variety of organizations and services putting organizations and businesses on-line, and somebody acting as a list creator like this. And in this case it's nicely centralized because Blacksburg is so self-contained. Let me do a link over to the *Roanoke Times*. Looks like they want you to subscribe, but they don't want to give you any news.

Another place you can go to find out what's happening in the local market is this *News Link* service, which I need to add to *New Links*. So here somebody has made the effort to be the central repository for all news, associations and organizations on the Web, many of whom are local in nature, particularly newspaper and broadcasting. And I think that we also will see an advertisement down there, so they are doing the old "build-a-list and sell ads," which is a technique for getting business in this crazy thing. So you could replace news with travel, with health, just with whatever it is, and you know that there's going to be a big list out there and there will be ads on it, but it will be a place to go to the sources that you're looking for.

Now, for our purposes, because we're interested in what's happening in local markets that affect businesses, this is an important one because of the role the newspapers have played in business relationships in any particular town. Here's the *Boston Globe*; let's see what they're doing. They've actually got a nice little Page, boston.com, and that football right in there is their dot. Go to "Today's Edition," and we see they've made it nice in black and white like a real newspaper. This is one rendition of how a newspaper sets itself up and how a newspaper involves its readership. Again, this is a piece of this business that obviously is counter-intuitive to a newspaper or a traditional media organization, in which in essence, instead of letters to the editor, becomes letters among the readers, which is oftentimes a major component part of any site.

But the fact that community newspapers are the focal point for many conversations or communities and sub-communities within a metro area — that's what they do, they tell the story of the community. What most of them haven't figured out is how to transfer that role that they've played in yielding the control factor that they've always had — in terms of who gets the story and the column issues dedicated to it, and where it goes in the paper — to providing the space for the community itself to create and write its own news, if you will. In order for them to succeed they have to do that, at least in my view.

So this is a way that the *Globe* has started to try to address that, by involving the readers. Yes?

M: [inaudible]

R. Taylor Walsh: I think this is. It says, "Post your own event."

W: [inaudible]

R. Taylor Walsh: So these are things that users have entered as their favorite thing. Let's see, you put the person's name and address there and it's a way for people to match their interests with one another; presumably that's what they're trying to do. Usually directories have always been staples of any on-line service worth their salt, and the Web has been bereft of them. It's just not part of the Web mentality so far, for providing a way for people to find each other.

M: [inaudible]

R. Taylor Walsh: Yes, yes. I just clicked on "Calendar," and we're getting some stuff. And this is good, they've got a "search" deal. Now, through the calendar thing — and, of course, a newspaper is keeping track with it on a daily basis — let's go over to another entity. We're going to go to Washington and take a look at another entity that lists events and calendar events and things that are happening. This, again, is a Home Page, and you look up at the top and some guy in the military thought this was a good idea to put this Home Page together, so we're going to get a lot of congressional and federal stuff — White House, Congress, everything you want to know about Congress and those guys. There it is.

But down here, I believe, is Washington D.C. locality information, and again here's another place that people have put together stuff relative to the D.C. area.

I was looking for one other thing... You ever look in the personal Home Page registry? I'm not there.

M: [inaudible]

R. Taylor Walsh: Used to call it the phone book, but now it will be the Home Page registry.

W: [inaudible]

R. Taylor Walsh: That does that. What you need to add to that is a matching capability, to show everybody in Washington who likes canoeing how to get in touch with them. That piece isn't there yet. It's simple, it's a fact.

I have been in the on-line business since 1981 myself, and it's been interesting for me to watch the evolution of the Web, because it's a page-based information repository; and what it has not had are the attributes of computer networking that have created electronic communities. They're just not in the Web in its page-based format. Yet images are great and everything, but it hasn't had conferencing affinity for groups, connectivity, newsgroups... It hasn't had directories where you can put out a "show me people who are canoeing in the Washington area." We haven't had that, but you're going to begin to see this.

Netscape just bought this outfit called Collabra, and you'll see other computer conferencing modules begin to come into this market to help overcome this. I think doing this across an interconnected network infrastructure is one of the problems. It's not that easy to do.

The Personal Home Page directory was put together by a guy named Phil. [Here's] "D.C. Power Brokers." We'll go to "Essence." And again, everywhere I've been around the Web there's a Home Page registry beginning to form in metropolitan areas, so the white pages are beginning to form and the yellow pages are beginning to form. It will be interesting to see

how that affects [the business climate] when the phone companies and when Donnelly gets involved.

Okay, so here's a bunch of names of people, and I forget where the heck we are. Here's a whole bunch; presumably these are all voluntarily contributed.

Let's see... What I was looking for was *Washingtonian Magazine*. Remember, we had looked at the Boston calendar of events the *Globe* put together, of course the *Washington Post* does the same thing. And *Washingtonian*, which is where we are right now, although they didn't give us our... But the point I'm trying to get to is that in a WorldWide Web — in the traditional media you've got a variety of different sources pointing to one event; in the Web you can get to the event. How many sources do you need to get the information about one event? And people will come to depend upon a place, a list or a route into any information that they get used to and want to have more information about.

I just wonder what happened to the *Washingtonian's* calendar of events. Maybe people won't go there, or they'll go to the *Washington Post* or some other place. The value of packaging in the editorial world has always been the key to any editorial thrust. They say, "We package, we've got a demographic of users of readers, of subscribers, and we're going to package our editorial to include these pieces because they fit the interests of these people."

I think that's going to break up somewhat. For instance, just in the experience of CapAccess, we became the place where all the local schools, libraries, and local governments put their information. The *Washington Post* comes into the market with *Digital Ink* and goes to all of those guys and says, "You have to give us your stuff and put it on our system." And the local government says, "It's already on CapAccess, go get it there." Well the *Post* says, "No you're obliged to do that, it's public information and you have got to give it to me," and so it will be formatted for their specific system.

And these governments — which are pretty big, a lot bigger than non-profit, and they're strapped for people anyway — they say, "No we're not going to do this, we're going to have one place where you can go, and whoever wants to reproduce it within their site can go get it." So the nature of the relationship and the packaging of content is going to be changed, and that's important because advertising and content are interwoven traditionally in free media or low cost media.

Again, you can tell from all these comments that there's so much that remains to be seen, because a year ago none of these issues were on the table at all, really. So I think they will become more so. That's not limited to the local marketplace, either, by any means. So there's tons of stuff in and around the Washington, D.C. area.

Okay, let me just go over some of these trends in the local markets, some of the factors that are going to influence how all of this has kind of evolved here. Again, these are listed down in the sheets I handed out: things that are happening technically, [things that are happening] within the Web generally, and things that are happening locally in businesses and in communities themselves. These are going to influence and play a role. What kind of role, and the nature and relationships of it, have yet to be determined; but I think the Web in general, and its advancement and its use of *Java* and animation and that kind of thing, is something to think about, particularly if you're in business.

The security and transaction capability is going to be a big issue.

On the content side of the Web we're going to see more personalization, more user involvement in sites and in the nature and the content of the sites themselves. We saw that the *Globe* has made it possible for people to create, to contribute, and to feel part of the site that they are using.

The links — we've seen links all over the place, and the Web also looks like it's going to become part of enterprise-wide, inter-corporate networks. It's going to replace to some extent

or complement the enterprise-wide information systems that we know of today. I think that's one reason Netscape purchased Collabra, because it wants to get into the collaborative work marketplace.

In the PC market, generally people are trading up to the next-generation PCs to get CD capabilities and the operating systems and all this painful stuff, so that we've had that [glued] on to our system over the last year. It will become much simpler, it will be part of the systems themselves and that will make it a lot simpler for just everybody to use, and that means more people will be able to get into this market and be users and be involved.

Locally, the home office and telecommuting are going to become more of a factor. Local businesses are doing business beyond their local markets with greater efficiency. I think we're going to see more private and public sector mingling of project bases.

Another factor is that as corporations are down-sizing, as the government — particularly in the D.C. area, everyone is terrified of the federal down-sizing that is about to take place, because the Washington, D.C. area, as I'm sure you can appreciate, is nothing but federal employees. As that begins to happen everybody is very, very worried, from the individuals themselves to the local economies, the local governments and the tax bases — it's a huge potential problem, and I think, depending on what part of the country you're in, that your city is going to be affected variously by whatever shake-outs there are. So there's a huge [amount of] re-training that needs to take place.

In local media, the newspapers — as we've talked about — their primary objective in all of this has been to protect their classified advertising base, from the business perspective. At least that's been a very important consideration.

There's something called a "New Century Network," which was formed about six months ago by the six leading newspaper companies, media companies for whom newspapering is their primary business — the *Post*, the *New York Times*, the *L.A. Times*, Knight-Ridder — and they got together to try and create some standards for how newspapers get into the business, though all of us think they've already been left behind in that regard. One of the things that they have done is to create a service called careerpath.com, which is a first effort to create a Web site designed for jobs and career information.

I know that everyone has always thought that this was a natural thing to put up into an on-line environment, but my experience is that they've never worked. I don't know why, but they just have never worked. But that's what that group of newspapers is doing. As I said before, many of these newspapers who have been using America Online and CompuServe and Prodigy as their first place to put their stuff on-line are now adding Web pages and Web sites to complement those, so as to not miss the Web train.

And the other factor is that the newspaper industry is suffering layoffs like crazy. Their financing and economics are becoming worse all the time, and the cost of newsprint has gone up a ridiculous amount every year and it has a negative effect on their operations and editorials and news rooms. There's a lot of suffering going on in the news.

The phone companies, locally, really have been interested in competing in the long distance markets and getting in the cable business and being able to deliver video, video-on-demand. The phone companies have spent lots of their money developing the means to get into the video-on-demand market, and have missed the whole Internet thing. Now they're all coming back to it. As I said before, Bell Atlantic is going to roll out an Internet access service.

Other telephone companies in other parts of the country have been variously involved with some kind of Internet access, whether they are Pacific Bell or Ameritech, among others.

[Tape change]

M: Why have the phone companies missed the Internet?

R. Taylor Walsh: Why have the phone companies missed this? I'm only reading tea leaves, but my guess is that they believe that the big win for them is to be in the information business, to be in the entertainment production business, which is why you've seen some of the phone companies in alliance with Hollywood studios and with the big wheels of Hollywood. They want to move film and video into the home and they've seen the cable business selling video productions for years through their channels, and I think they want a piece of that business. Because one of the things that is interesting to me is that the Internet has shown sort of how dirt cheap communications really is. It's like it costs nothing, and it's becoming more and more of a commodity as time goes on. So they want to be getting themselves into the content business.

They never have believed that the personal computer is the device that it is. They've gone through the development of set-top boxes, which are converter boxes which will sit on your TV that will bring whatever you want in at whatever time you want. It's interactive according to those guys in the sense that you can press a button and change the channel; that's interactive to them.

But I think, basically, that it's been a big disbelief in the power of the personal computer, and I've seen the personal computer-based on-line services run through more multimillion dollar business plans in the last 15 years than I care to shake a stick at. Every time somebody has said, "Well the PC won't be used, let's get this special device," the special device hasn't worked because all these guys have underestimated [the PC's] value and power and the appreciation that the individual user has toward what it can do for them. That's my reading of it.

Now, of course, you're hearing a lot about the deployment of ISDN in local markets. ISDN is a digital transport technology, which means it will move computer graphics and files and stuff in a real protected manner, better than your standard phone lines, but it goes across the copper in your house or in your business and you don't have to tear up the floor and put fiber in it. ISDN has been long a part of the telephone company's technical infrastructure for many years; but it has limits in terms of how fast it can transport data. It cannot transport data fast enough to move a movie to your television set.

And if, in fact, the phone companies have been most concerned with delivering video, and that's where their strategy has been — and it's obvious to me that's where it's been — then putting anything into ISDN, which is a relatively slow speed, they have considered not worth their while. Had they jumped on ISDN in the Internet market two years ago there would be no PSI or UUNet; it wouldn't exist today. But they do. So the phone companies, and particularly AT&T and MCI, are getting ready to launch Internet access service, so you ought to be able — if you're not looking at \$10 a month Internet access from these guys in the next six to eight months I'd be surprised — right on your phone bill, another eight to ten bucks for Internet access.

M: [inaudible]

R. Taylor Walsh: Again, this is why you're seeing AT&T — which has this interchange platform, which is a content-based service even though they've set it out as a platform to license to the *Washington Post*, *Minneapolis Times*, *Tribune* and many others — they want to be in the content business. MCI has got a deal with News Corporation, Rupert Murdoch's company; they all want to be in the content business. And this is what the cable guys [are doing]; John Malone is in the

content business. Content is what draws people back, not dial tone. You've got to have [content].

So all across the board you're seeing the communications companies trying to get into the content business. I thought one of the very important recent announcements — if this goes through — was that Time Warner is going to become an Internet access provider to the CompuServe world-wide network. And what this tells me is that Time Warner is looking at this world and saying that it's not good enough for me, Time Warner, because I have to control my points of circulation and where circulation comes from, and the best way to do that is to be an access provider and not depend upon some third party.

It's an interesting thing; they see their electronic printing press then, not just as a bunch of servers over in a site but as a network itself. That's their electronic world-wide network of access, that's their electronic printing press.

So you're seeing the communications and content begin to be fused all along the line of major players.

M: What are your thoughts on what's going to happen with some of these small local providers, access providers with a small Web, trying to divide it? Do you think the big guys will beat out the little guys?

R. Taylor Walsh: Everybody hear the question? Clearly that is the question of the moment, and that is a huge question right now. If I was an economist, a Harvard MBA guy, I would be able to say, "Well, in other industries here's what's happened when the shake-out comes..." And it may or may not apply to this business; this business seems to defy everything that's gone before. But consolidation is clearly going to be in the wind, and I think that the smaller guys are going to say, "We can do a much better job attending to you and your business because we're here in your market, over in Basking Ridge, New Jersey."

And you can say that's what's going to happen, and I presume that these smaller guys are going to try and focus on a niche either within a service area or on some component of Web service of higher value. In the access provider business, where you've got — in the D.C. area we've got 60 access providers and there are probably 60 up here, and they range from everybody who's got 10 lines to the people who've got a T-3. I think something is going to have to happen, some kind of consolidation or some kind of change in business, or Bell Atlantic or New England Bell will buy them out and buy their customers or something. But their economies of scale — they're just re-selling circuits anyway, so for the originator of the circuit that wants to get in the same business his economies are going to let him price the thing much lower than one of these smaller, independent guys.

Now, whether they'll do that or whether we'll see in the access business what's happened in long distance [business], you could have — everybody prices off of AT&T in the long distance service, and you've got hundreds of these little long distance companies out there. It could be the same thing in the network business as well. So I think it's still very much up in the air how that's going to happen, how the financing is going to take place to make that happen.

In local markets we don't want to leave out our friends the cable companies, who look like they want to get into the telephone voice business. They also want to apparently try to roll out access to the Internet through the cable plan. Can you tell us any more about that particular focal point, what the experience has been?

M: [inaudible]

R. Taylor Walsh: Comparative costs between the cable access to the Net versus telephone access?

M: I don't think there's any pricing that has been established, because the trials — correct me if I'm wrong, but most of the trials have been dedicated to deploying cable modems. Zenith and General Instruments, companies that have traditionally made the hardware for the cable industry, have now moved to try to make cable modems.

M: [inaudible]

R. Taylor Walsh: They've been testing connections but not pricing, as far as I'm aware of.

M: [inaudible]

R. Taylor Walsh: It's not only cable modem, but the cable company has got to re-engineer his plant right at what they call the "head end," and they have to build in the Internet technology and structure to back it.

M: [inaudible]

R. Taylor Walsh: But I think it's seen that enough of their problems are solvable, and the ultimate economic model works. And another thing you can look at is companies like Cisco and other companies who make the hardware for the Internet, routers and that kind of thing; they are moving aggressively to develop ISDN modems right now, and presumably other cable-based equipment, so we're just at the beginning of where they've made the commitment. Their business plans now include extending their own lines and products to get to this higher speed infrastructure, whether it's to cable or through ISDN or other telephone company services.

M: [inaudible]

R. Taylor Walsh: You see, a lot of us have been out there and now we're looking at — and here come the train companies, laying their tracks down, and we just hope we're not looked at as buffaloes as they go by.

Elsewhere on the local market are places, particularly in business, and what businesses have to think about — advertising agencies right now are still trying to figure this out, how they play and what they're supposed to do. Their clients are coming to them and saying, "Get me on the Web. What do I do?"

And what I think we're seeing in many cases is that a traditional ad agency is turning to a company locally that is already in the Home Page development business, and doing an alliance with them. For many of these, what I have seen is that they're graphic companies that specialize in high-end graphics, and they do corporate brochures and that kind of thing. High-end visual graphics have, in the last year, extended themselves to actually implement these for CD-ROM or for Home Pages.

And some of them are actually quite good, and they're also building on an existing client base. Down in Washington a group I know has Marriott, USAir, and a whole bunch of other corporate clients for whom they do a wide array of graphics work. And now they're in the Home Page business; they're serving their existing clients.

There's a company out here — I can't recall the name, but they're a provider and they have gone into partnership with another graphic design firm. So you're beginning to see

alliances, and as the specializations get fused, as graphics and networking and other specializations are fused in the Web, you're seeing alliances happen in ad agencies.

I think another thing that you've noticed is that the technology and infrastructure of the Web is basically set. We pretty much know how it works and what's going to make it work. How information and content is displayed is pretty much understood. I mean, there's a lot of work to do, but how pages appear and what you can do in those pages, what you'll be able to do with a *Java*-based or an animation-based [page], that's pretty much understood. We might not be there yet, but the road is there.

From a business perspective and a marketing perspective, what is now just beginning to be applied is a marketing perception and a marketing mentality to this whole thing, and that has been absent. I think right now, around the country and in many cities, the local chapter of the American Marketing Association or somebody like that has been holding seminars, talking about the Internet and the Web as a marketplace because it's now seen that way.

There is a market there; there are millions of people there, and therefore if the customer is there then we have to figure out how to get our clients in front of them. That Zima Home Page I mentioned earlier, those guys at Modem Media in New York have been sort of a leader in this and have done a very good job. But you're beginning to see this — as far as dealing with the Web as a marketplace — where you have marketing principles, and you have to begin to see those things come into play.

Another factor in local areas that relates to the community itself... We talked about the Web technology and business considerations and the media who are central to the business relationships with buyers and sellers. You know, we have something called "regionalism" beginning to emerge in metropolitan areas, and concepts like "fringe cities," where in the Washington [area] — and I guess up here in Boston out on Route 128 or somewhere — there may be a suburb of Boston that's so self-contained that nobody comes to Boston anymore; they work out there and they live in New Hampshire and they come in 20 miles and that's where they work.

The same thing is happening in every metro area around the country. And the public sector is running out of money; what you're seeing is continued spending on technology in the public sector. State and local governments are spending a lot of money on computing, and we see that a lot of states around the country have put in place state-wide information networks linking libraries and schools. It varies from one state to the other how extensive and comprehensive it is, but what they're doing is ultimately creating public points of access to all of the resources on the Web.

Many community networks have worked with libraries to get public access workstations in the libraries and community centers, so you're going to see public access centers linked to the Web. Really, a state-wide network or county-wide network will become much more commonplace in the next couple of years.

Another factor, of course, is the current Congress, which wants to give local control back to states and localities. We have urban cores in the cities that are in big trouble; education is in trouble in many sectors and many parts of the country. Again, though, a lot of schools are getting PCs and getting networks. In our local area I don't think it's possible to speak about metro area webs or a business web in isolation from whatever else is happening; it's just not possible anymore. That's why I bring these factors up, because they'll play a role in how the metro area webs evolve.

We talked about what's happening in Washington. I think that many of the business issues — as you go into a metro area to deal with business and to try and get them on-line and make the sale to them, the issues that they care about are going to be about just generally the same, many times the same that a Reebok or a General Motors or somebody else cares about

in terms of, "What's the value? How do I know this is going to be useful to me, how much is it going to cost me? How am I going to be able to measure the value of this kind of thing?"

So those are the business issues, and again, as I said earlier, I talked about some of the banking and financial relationships and it's too unclear right now to know, for instance, [whether] a small chain of video stores in an area that does business with a bank, a regional bank, is going to be better off working with a large Nations banker or Royal Bank of Canada instead of its traditional local bank it has always done business with. Whether the economics of doing that in the service level is going to be sufficient so that he's going to be compelled to no longer deal with his local regional bank, [it's hard to tell].

[There are a few] other factors I haven't gotten into. Electronic data interchange, electronic commerce, and things that are part of the infrastructure that are going to play a role, but it's still a little early to understand how those are going to play out.

What other questions do you have? Okay, if you didn't [get it] there's a little handout on the chair back there that you can pick up and take with you, and I'll be glad to answer any of your questions, or we can go over any other or visit any other places around the world. Otherwise I thank you for coming.

TUTORIALS DESIGNING AND MAINTAINING YOUR WEB SITE



SPEAKER

Peter Morville

Vice President, Argus Associates, Inc.

Peter Morville: My name is Peter Morville, and I'm Vice President of Argus Associates which is a Web site design consulting firm located in Ann Arbor, Michigan. We work with organizations to help them develop large-scale Web sites. We concentrate on the architecture. When I mention architecture, I refer to things like the organization of information, the labeling of information, cross references between various sections of the Web site, the application of search capabilities, balancing form and functions. We'll talk more about all those in a little while.

In my free time, I'm a manager of on-line services for Michigan ComNet which is an on-line community for non-profit public service agencies in the southeastern Michigan area. In that job, I've come across some of these architectural issues from a little bit of a different perspective, developing an on-line community because a Web site doesn't have to be just a place to disseminate information. It can be a place to bring people together in the community.

I have a background in information and library studies, and for the last few years I've been looking at how we can take some of the skills and the knowledge base from the library community and apply these to the on-line environment. Over several decades there's been a lot of thought put into how we organize print materials, books and encyclopedias and so forth. How do we organize the books themselves? How do we organize collections of books to facilitate browsing and searching? When you walk into a library, you may want to go right to the card catalog or the on-line catalog, do a search and find a particular item. You also might want to browse, look through the shelves, and that introduces the element of serendipity. I might find something I wasn't necessarily looking for, but something that is of interest to me.

Before I move on too far, I'd like to get a little bit of a sense of who are you, what you are looking for. My partner did a similar presentation at Mecklermedia this spring out in San Jose, and he found a lot of the people at that session were in their MIS Departments within their organizations, and they'd been given the job of putting up a Web site for their organization. Their senior management decided that the Internet is a technical medium, computers and networks and so forth, so it makes sense for the MIS Department to do this.

A lot of these folks in the MIS Departments were feeling a little confused, a little concerned. How am I going to do this? Is this something I can do by myself or do I need to bring in other people? Is putting up a Web site simply taking some brochures and sticking them up on-line or is there more to it? So let's take a couple of minutes, and maybe if a few people want to volunteer, just put your hands up and tell us, you know, how is the Web site within your organization being developed? Are you in the MIS Department and has this been dropped in your lap? Do you come from marketing and so forth? Yeah.

M: I am from the MIS Department [inaudible].

Peter Morville: Great. Looks like you are a long way ahead of a lot of other folks. In the front.

M: I was just going to say that I'm a corporate librarian. I'm not from MIS, and the people in the MIS Department feel it's more of an inclination to them because [inaudible] so it's become my task to become the real master and pull all this together.

Peter Morville: Great. Sure, sure.

M: I work in the research division of my organization and the primary reason why we got our license was because he wanted to interact with other research organizations and since we started the whole thing and sort of ended up not [inaudible].

Peter Morville: Okay. We're seeing some difference approaches here. Yeah.

M: [inaudible]

Peter Morville: Great. So we're seeing a few librarians here. In the back there.

M: [inaudible]

Peter Morville: What we're seeing here is sort of a diverse group of people in the audience that have been given or have taken a lead in developing a Web site. We also saw that some Web sites are internal. At this conference and over the past couple of years, it's been much more focused on external Web sites and the marketing component. Over the next few years I think we're going to see much more growth in the idea of an internal Web site as a communication and collaboration tool. Through this presentation, I'm hoping that some of the methodologies that I'm going to talk about for developing a Web site will apply to both internal and external Web sites.

What we're going to talk about today is Web site development, and I'll give a little introduction to that. We're going to talk methodology. There's no one way to develop a Web site, and depending on the size of the organization, the type of your organization and the size of the Web site, there may be many different approaches to take. What we're going to talk about today is mainly focused on a large-scale Web site, a large organization, and we're going to talking about an intra-disciplinary team approach which may involve a number of teams, including an architecture team, which is really my area of expertise. I'm going to focus mostly on that. But also a design team, graphic design and layout, a marketing team: who is your audience and how are you going to reach them? A technical team who is going to make things happen. What can we do with this medium? What are the limitations? What are the opportunities? A project management team who is going to facilitate communication and collaboration between these various teams to make sure that the project stays on time and within the budget.

I'm going to talk about some phases. The research phase is merely an information gathering phase. What are the tools and resources, people and technology that are available to us? How about content? What is the content available that we can put on the Web site?

Then the conceptual design phase: what are we going to do, what's this Web site going to look like? So it's form and function. What's it going to look like, what's it going to do? Planning for production, how is this going to happen? Time lines, opportunities for parallel development, dependencies, a lot of planning here.

Production, making it happen. One of the people that we work with, a technical team, likes to say that production should be painting by number. In the planning for production, you've got everything ironed out and then you just make it happen in production. When in reality, the production phase ends up — you always run into problems and have to put out a lot of fires. Then maintenance, which is a little bit of a wrong label because once your Web site is up — it's been launched, it's up — it's unlikely that you're going to want it to stay just the same as it is. You're going to get feedback from users, suggestions for new content, the technology is

going to evolve, so you're going to be going through a constant process of interactive design, getting feedback and redesign.

That's one of the places where architecture comes in, because you want to make sure that as your site grows you don't have to go back to step one and redesign the whole site. You want to design with growth in mind.

We'll talk a little bit about evaluation. How do you evaluate whether your site is successful, whether it's met its goals? Then just a little bit about keeping current. What are some resources so you can go away from here, after today, and keep up with what is going on?

Before I continue on, if you have questions during this talk, feel free to raise your hand and I'll see if I can take them. If it's something I'm going to cover later then I'll let you know. I'm planning to take a break about halfway through for ten minutes.

What types of organizations develop Web sites? All kinds: business, universities, non-profits, a lot of government agencies, publishers are really starting to explore this medium. Very small companies and very big companies and rich and poor companies.

Probably one of the most popular and often-quoted cartoons is the one with the dogs sitting at the computer and the caption "On the Internet, no one knows you're a Dog." Well, that really hits home, this fact that a small company can really sort of compete in the global marketplace with the larger company in this medium. It's not that easy to tell that the company you're looking at, the Web site you're looking at, comes from a small company. So it has a real leveling affect.

Why do companies put up Web sites? One of the more common reasons is because a competitor put one up, so they know they have to put one up and they're not sure why except that it's the competitor's. The competitor made that decision. The underlying reasons are marketing, putting out those on-line brochures, but you can go beyond that. Sales — there's been a lot of talk at this conference about security and creating a secure environment for financial transactions. I think we can expect that to happen, and sales are going to take off, but they are not necessarily going to be the most important part of the on-line environment.

Information dissemination — a real cheap, fast way to get information out to customers and prospective customers. Customer service, to establish interactivity with your customers, e-mail and Web-based discussion forms are another way to make yourself accessible to your customers and to get feedback.

There's a short term and long term view. Some people put up Web sites with the specific goal in mind of a return on investment, maybe in six months, maybe in a year. Others realize that they're going to have to pour a lot more money into this new environment in order to position themselves strategically to take advantage as the environment grows, as more people come into this environment and as the technologies come into place for secure transactions and so forth.

Under what circumstances? Sometimes a Webmaster gets lots of money and a nice long timeline and kind of goes ahead and develops a Web site in sort of the ideal fashion. More often than not, you get told, "Well, we want a Web site up at the end of next month and we can't really give you any more money, just make it happen." Well, hopefully, this talk will give you a little bit more ammo if you're in that situation to say, "Look, this is important to our organization and it's not simple, it's not throwing some brochures up on-line. Here are some of the things that need to happen. Here are some of the people that need to get involved in order to create a Web site that portrays our company the way we want to be portrayed or represented."

Who develops Web sites? We talked about internal staff and some of you are responsible for developing your Web sites. Some companies hire external consultants and say, "Here's all our content, put a Web site up for us." There are some down sides to that. There's

a lot of potential in involving people within your organization in the development and maintenance of your Web site, but ideally it's an intra-disciplinary team approach. We're going to talk through these teams and these phases, but I do want to make the statement that it is more an art than a science.

This is one way of developing Web sites, and there are probably other ways. Towards the end of the talk, if other people have other ideas we could discuss those as well.

As I mentioned, the marketing team needs to focus on the customer, the audience. Who are we trying to reach? Are there multiple audiences? How are we going to get them to come to our Web site the first time? How are we going to make them come back? They want to do this to a synthesis of conventional market research.

A lot of your organizations are very... you've done plenty of market research, and for instance, throughout this talk I'm going to refer to Argus, my company, which is in collaboration with a number of other companies with complimentary skills. We're at the beginning of developing a large-scale Web site for a company that owns a national chain of bookstores. And I'm going to use that as a sort of case study as we move through this.

Well this national chain of bookstores has done plenty of market research. As they open new bookstores in various cities around the country and they ask questions, you know, what are the demographics of this area and do they match the demographics of the people who tend to frequent our stores? We want to tap into that existing market research, but we also want to realize that now we're opening a bookstore in a new location all together in Cyberspace, the on-line medium. What are the demographics there? Who are our potential customers now? Who are our potential customers in a year, five years from now? How are those two market research studies going to come together?

The marketing team is also responsible for marketing the Web site once it's up. We want to integrate traditional and on-line marketing approaches. Let's make sure that all of our print materials have URLs, bookmarks that are distributed in the stores, our bags, business cards, and so forth. Let's also explore the on-line marketing channels. Is it worth \$40,000 to advertise in *Yahoo* for three months? Is that where our audience is going to be? These are some of the questions the marketing team needs to address.

The architecture team, their responsibility is to create an information architecture that supports [inaudible] navigation. For those people that are browsers, coming in to look around your store, clicking from link to link, you want to make sure they don't get lost, that they have a sense of contact so they move through your site. You also want to allow for people that come into conduct directed searching. I know what book I want. I know the author's name. I just want to find it and order it. Well, I want to allow for that too.

As I mentioned, you also want to create this architecture to allow for a site to grow and expand. We don't want to trap ourselves in an organizational structure that won't allow us to add another menu, that will force us to re-engineer.

So the architecture team is going to go through a process through which they come up with a blueprint that specifies how the information is organized and labeled, the application of search capabilities and the use of navigational aides. We're talking about varying levels of granularity here, from the organization of the whole Web site to the organization of pages and the navigational elements on those pages.

The design team is responsible for coming up with the design philosophy, balancing form and function. You see a lot of splashy graphics out there on Web sites. Is that what we want? Do we want to have almost no graphics and go with functionality so people can come to our site very quickly? Or do we want to find a medium there?

How about designs for multiple platforms and browsers? Something that looks good on *Netscape* with flashy cables and centered tags and so forth, might not look so good to the

America Online or CompuServe user. Do we want to cater to those Netscape browsers and say we're just going to support the 80% of people that are using Netscape? Do we want to stick solely with HTML 2.0 so that everyone has a similar view of the information? Do you want to find a balance somewhere in between? Do we want to split our architecture so we've got a site for Netscape users and a site for text only or for other types of browsers?

These are some of the things that the design team comes up with. Then they actually move forward as we go into production phases in the graphic design. They design the pages, the graphics, the layout of the page, and there's some interchange there between architecture and design. These teams need to work closely together. They're responsible for the copy editing. They may be responsible for the HTML page production. There are also cases where the technical team is going to be responsible for that, but for now we'll just leave it there.

Then there's the technical team that acts in the early phases as a consultant to the other teams. What's possible? What can we do, and what are the implications of these applications? For instance, if I want to put up an on-line conferencing system, a Web-based discussion forum, what are the associated costs? Is that going to have an impact on our timeline? How about maintenance? Do we need conference leaders to keep this conference going? Who is going to do that? The technical team is our reality check in this process.

In the production phase and the maintenance phase, they're the ones that actually build the tools or integrate existing tools. They come up with the processes and the procedures to make sure things happen. They're going to look at what it takes to get this site up, the development cycle. What is it going to take to maintain it and who is going to do that? Are they the same groups of people that develop and implement and maintain the site?

Other tools they might develop or integrate include the search capabilities, on-line databases, a registration and authentication interface. They're going to want to tell you about the implications of that. Will it work on all browsers? Will it cause problems to the users? There we get into some interface design issues and conferencing, as I talked about.

Then we've got that project management team keeping the teams talking and working together, keeping the project within the budget and on time, managing any financial and legal issues that come up, making sure that senior management knows what is happening and relaying any needs of the individual teams to senior management.

They're also looking for areas of overlap between the teams. Sometimes those areas of overlap might be good. You might want to build some redundancies into this project. You also want to look for the gaps. What are we missing? Make sure that those are filled.

In the research and conceptual design phases, there is going to be a lot of collaboration and communication between these teams, a lot of group meetings, brainstorming sessions, meetings of various departments of the organization to make sure that everyone is getting the same picture of what the organization is and where they want to go with this Web site.

So there's a research phase. In this phase we want to think about division of our company and of our Web site and how they relate. The same goes for the mission statement of the company. Let's take a look at that. What are our goals? What are the goals of the Web site? Who is our audience? Do we have more than one? What's the content that's going to be on the site? Who are the contacts in the organization? How are we going to make sure that we get feedback and input from all the people in the organization?

Let's take a look at division. Why is it important? It will be hard to attend this conference and not realize that we're in the midst of a paradigm shift in communication and information sharing. It's on a par with the invention of the printing press and the telephone.

We're at the very beginning of the shift, and the Internet is new and very dynamic. Processing speeds are increasing every year. Bandwidth is moving very quickly. The interface is

improving as money is poured into this arena, and Netscape is going public and the stock is going through the roof. There's a lot of money being poured into designing better interfaces.

With Netscape and *Netscape 2.0* we're seeing an integration into single interface for browsing the Web and doing e-mail and publishing on the Web. People and businesses are becoming much more familiar with this technology, getting past that fear of the technology and starting to push it and say this is what we want to do with it. Now we see where we can go.

So this technology network of information and communications is a snowball that's just started rolling, and I think it's going to pick up speed. We want to think about what this means to your business and your industry. You need to change to survive. There's a few librarians here. In the library field, there's a lot of fear about what this new environment is going to mean to libraries. Some people say that in ten years libraries are going to be gone and it's all going to be on your computer screens. There's quite a lot of librarians out there that don't know if that's true or not. I don't think it is. I think that librarians and information professionals are only going to become more important in this environment.

But for each business, you need to think about the effect now, a year from now, five years from now. How can I leverage this medium? The first step is the marketing, and we've seen that over the past couple of years. We're moving into more sales and on-line transactions. The problems with that factor is that it competes with existing sales channels. Some of the leading companies are moving into the innovation phase. What are some new products and new services that we can create and produce and disseminate that we couldn't before?

One of the companies that we've been working with in Michigan is University Microfilms International. They began as a microfilm company. They print materials, magazines and newspapers, convert them to microfilm and disseminate them to libraries all around the world. In the last several years they've gotten into the CD-ROM business. They said "We're not going to call ourselves University Microfilms anymore because that's an old technology, so we'll just say UMI." They're sticking with that. Now they're thinking, "Are we in the microfilm business or the CD-ROM business? Very recently, due to some internal efforts from some people that have some vision in that company, they're starting to say, "Boy, we've got to look at this Internet. What is that going to do? Is that a way that we can get our information out to people?" Their first idea was, "Let's use it as a marketing tool. Let's just let the world know who we are." And then they thought about sales: "We could sell our microfilm and our CD-ROM products over the Internet."

But now they're starting to push forward and say, "Boy, we don't need microfilm or CD-ROM, at least not in the future. We're going to be able to disseminate our information directly over the Internet. Let's start looking at new products and new ways to package information that we couldn't have done before."

So they're not thinking of themselves as a CD-ROM company or a microfilm company or an Internet company. They're thinking of themselves as being in the information business. You want to think before you start developing your Web site, "Is there something similar going on in my industry?" Along those lines, you want to think about your mission statement. Does it still work? Do I need to re-think my mission statement? How do the goals of my organization and my Web site relate?

Thinking through long-term strategy versus short-term return on investment, "Where do I fit in that picture?" Is this an experiment just to see what happens when I put up a Web site, or is this something that's mission critical that's going to affect whether my business survives or not? All of the answers to these questions are going to affect what kind of budget you want to allocate to your Web project. You can use it for sales or marketing, information dissemination, customer service and so forth.

Are you thinking about your target audience? Are we trying to reach consumers or businesses? It's probably going to be multiple audiences because anyone's going to be able to look at your Web site. How about your business partners? What image do you want to represent to them, or is there information you want to make available to them? How about investors? Do you want to share information with internal staff that's perhaps spread out around the world?

Then we start to get into that line between the external Web and the internal Web. How about journalists? Are we going to use this to spread press releases and background information? Some audience analysis [is needed]. Is your audience using the Web now? Is it going to be using the Web in a few years? What information is most important to them? Why are they going to come to your Web site? Why is the Web a better medium for them to get to your information? So how are they finding information now? Are they making phone calls? Are they getting fax backs? Are they coming into the store?

Okay. So we begin that research phase and we want to start thinking about the content. Yes.

M: I'd like to ask about your audience definition and so forth.

Peter Morville: Sure.

M: One interesting idea, without actually placing the ad, is using an e-mail address or a Web site to see what sort of a response they would get. Do you have any other tools or recommendations on how to evaluate your audience?

Peter Morville: Good question. Let me see if I've got that straight. So you're saying, put up a sort of a temporary Web site with some feedback capability so that people, your audience, might see that and respond and say, "I like the idea of putting up a Web site?"

M: Well the one example I heard talk about was to place ads in the various... You think your audience might be coming from, just to let them know that there is a Web site there to see if anybody gets to it.

Peter Morville: Sure.

M: [inaudible]

Peter Morville: Sure.

M: But I'm wondering if you have any ideas or suggestions.

Peter Morville: A couple off the top of my head. One might be that there's a lot of on-line communities, self-defined communities on the Web, the UseNet group, the listing services. Take a look and see if there are any communities that look like they're composed of people that are your customers and get involved with those communities and see what they're talking about. Maybe throw the question out there. Would a Web site be helpful? What types of things would you like to see on it? So there's one idea.

The other is focus groups, meeting with customers, having them fill out questionnaires or just talking with them about ways in which you can help. Are there other ideas from anyone in the audience?

M: [inaudible]

Peter Morville: Sure. Put up a real basic Web site with a forum, a feedback forum and let your customers tell you, "Yes I'm on the Web, yes I'd like to see information."

Okay. So we're brainstorming through content. What do we have to make available that the customer might want, that these various audiences might want? In a large organization, content is probably going to be spread out across a lot of departments, divisions, subsidiary companies and so forth so you're going to need to identify, "Who do we need to talk to, to see what they would like to make available on the Web." These discussions might need to be facilitated because they might not realize the capabilities, what we can make available. It's not just static information, but we can make dynamic information available. We can make people available on-line, too, so we can assess all of the potential for content.

Then, to borrow from the library field, we want to move toward a collection development policy. Once we've got all of these different pieces of content outlined, we're going to come up with some policy that says what we will and will not include on our Web site. And this might help us down the line as people have suggestions of what to add.

One of the areas where this becomes important is that a lot of Web sites add pointers to other Web sites. Do we want to do that? Do we want to send people away from our Web site? The book store that we're working with, they used to have a Web site that had a sort of virtual library of other bookstores on the Web. Do we want to send people to our competitors? So we want to think through what we do want to include and not include on the Web site.

Then we need to set priorities. We've got our wish list of content, what's realistic. We want to think through the production costs. What is it going to take to make this content available? What is it going to take to maintain it? Are there copyright issues involved? Can we actually legally make this available? You might want to think about the six months and the one year picture. Maybe we'll put this content up now, but we'll look to extend the site over the next several months.

Okay, we've identified who the experts are with respect to content, who are the experts with respect to the audience, your salespeople, the people that are dealing on a daily basis with your audience? Let's bring them into this process and make sure we're getting some input from them.

The same goes with the marketing department. Who are resources for graphic design? Do we have people in-house that can do our graphic design or do we need to go outside for that? What's our technical infrastructure? Do we have an infrastructure to support maintaining information? Do our employees have access to the Web so they can see what is happening and contribute? We need to think through how the teams are going to communicate through the various phases of the project with each other and how they are going to report to senior management. How are we going to solicit input from staff and customers?

So now we're moving into phase two, conceptual design. And this is defining what the Web site will be, the form and the function, developing an architectural blueprint, a design philosophy. We want to come up with templates for the main pages. Those are the most important. Those are the ones people are going to see most often. We want to make sure that we develop pages that don't confuse or frustrate the user but that invite them into your Web site. We're going to come up with templates for subsidiary pages so that as you go into production and you've got lots of content, you can pour that content into these templates to preserve the continuity throughout your Web site and provide users with a sense of context.

If there are advanced tools and features that we want to implement, conferencing and databases and so forth, we want to think through the interface design in this phase. What's the look and feel going to be, how is it going to work? We want to make sure that we're including people in this process. We want to get buy-in. We don't want people upset that they didn't get to tell us their brilliant idea about what to do on the Web site, so we want to be inclusionary.

We talked a little about Web site architecture, organization, labeling, cross-referencing, search and navigation. Why is it important? From the user's perspective, navigation and usability. They need to be able to get around your site. You don't want to frustrate them. You don't want them to get lost. We want to support browsing and searching. From the organization's perspective, you want to support the goals of the marketing team whether it's selling products or simply extending the image of that company. Yes?

M: What kind of person is it that works on the architecture?

Peter Morville: That's a good question. What kind of person is it that works on the architecture? Well from my perspective, it's a librarian or an information professional, somebody that understands how we organize information. Yes?

M: [inaudible]

Peter Morville: Sure. We actually work with a graphic design firm in Ann Arbor and there is a lot of overlap between what we do and what they do. We actually work very well with that firm, but there are other firms that are saying we're going to try to adopt this architecture. We're realizing that it's not just important how people navigate around a page but around a site, so those folks might also take this approach. Yes?

M: [inaudible]

Peter Morville: There's another.

M: [inaudible]

Peter Morville: Great. Yeah?

M: How would you suggest setting up the front page so that people do not get lost?

Peter Morville: That's a good question and we'll get to that and have some slides with some graphics to show. Yeah, one more.

M: [inaudible]

Peter Morville: Right. Great, great. So what we're saying is that there are a lot of traditional disciplines; graphic design, librarianship, interface design, technical communication. A lot of these professions are disciplines that bring things from the traditional environment into the on-line environment. From an organization's perspective, as I mentioned, you want to support the goals of the marketing team and you want to allow for growth. You don't want to have to re-engineer your site because you want to add something.

Okay, well at the very top level of your Web site, you're going to have gateway pages, maybe one page, maybe more. This is the initial point of entry to the Web site. This is the URL

that you publish. There are certain marketing goals that you want to achieve here. You want to have that splash affect — “Wow, this company looks neat.” You also want to have an inviting effect: come further into our Web site and see what we’re about.

They want to serve a shepherding role in redirecting people to certain sections of the site that make sense for them. One of the organizations we’re working with right now is the Library at Michigan. They serve three audiences in order of priority: the Legislature and State Government, Michigan libraries and the citizens of Michigan. They provide various levels of service for those three groups. What we’re doing with them is, they’ve got their gateway page and from that page they can get some basic information about the library. You can also click on an audience specific link. So I can go to the page that’s specifically for the Legislature and State Government or for the libraries or for the citizens.

From there, I’m on my main menu page. The main menu is an information system interface. You’re going to come back to it again and again. It’s the page you’re going to bookmark. It’s the page that you’re going to navigate from. So the focus wants to be on the navigation and the specific use.

A lot of Web sites integrate these two. They try to do everything with one page. They want to put splash and navigation on the same page. In certain cases that’s fine, particularly for small sites, but you want to think about the different things you’re trying to achieve and whether it makes sense to have those be one page or be two or three and so forth.

Okay, with the organization of information, what are some organizational schemes? You’ve got your subject or your topic, the very familiar way to organize information. In the library field we’ve found that’s the primary way people want to search for information: I want to find information on this topic or this subject.

You may organize it by audience, as I mentioned with the Library at Michigan site. There’s the information that is appropriate for each audience.

You may organize it by department. This is often a bad tendency of people putting up Web sites. We think of ourselves as our departments or our divisions. There is marketing and there is sales and there is MIS, so we’ll put up information that way, organized along those lines. The important question to ask is how your audience, your customer, thinks about your information. If so, it makes sense to organize it that way. If not, you want to think about some other schemes.

Some sites might lend themselves to a chronology for at least part of their site, and include timelines: when did things happen. [Or they might arrange by] geography; maps are a very common form of navigation. By product or service, or by format. Do we have a set of images that we want to make available? Do we have software? Do we want to put all of our software in one place?

Then there’s static versus dynamics. Do we have news and information that’s updated everyday and do we want to separate that from other content so that people know where to look for what is new? Or do we want to integrate that at a page level.

We want to explore metaphors. Is there a metaphor that will capture what we’re trying to do? With the chain of bookstores we’re working with, we were thinking you know, okay, we’re going to put up a Web site, what is it going to look like, what are the main menus? We were having some problems, and then we came up with the idea, “Why don’t we think of it as opening a bookstore in cyberspace, on-line? It’s another bookstore, a new bookstore. Let’s try to recreate the environment of coming into a bookstore. What are the options? You might want to go and browse through the stacks. You might want to go and ask a question. Where can I find this book? What hours are you open? So I want to have some human interaction there.

You might even take that a step beyond and say, "I like to go into a bookstore and meet people. Can we build that into this on-line environment?"

[Inaudible] metaphor because there are things we can do here that we can't do in a physical environment. Interactive searching; I want to go into the bookstore and I want to type in the name of the author and the book and I want to find it and order it. In some bookstores they're starting to put in terminals that allow that. We want to do that on our Web site. We might also allow for multiple ways of navigating through the store. You literally can't deal with a physical medium. We can't have our bookstore organized one way and then all of the books organized another way without having two buildings. In the on-line environment that's very easy.

We can also start to customize our bookstore to the individual user. Let's say I have a preferred reader program. Have people type in their likes and dislikes and each time they come back to the store they let us know who they are. Then their screen pops up with the categories of books they're interested in or the music titles they're interested in.

Let's take the shopping cart metaphor or a book bag. Let's say this customer is walking through our bookstore and they've got a shopping cart and they can throw books in as they find ones they're interested in. After half an hour of browsing they pick up four or five books and they come up to the cash register. They say, "Whoa \$400, I can't afford that." And we put these three books back and I'm going to take this book. A month later, one of those books they put back goes on sale, so we send them an e-mail message letting them know that it's available at a lower cost. So as we explore, this metaphor provides some real fuel for brainstorming.

With labeling sort of tied in with organization, we have to have labels for our information before we can organize it. I want to try to use the language of our audience, the terms and phrases they would use. I want to be consistent with the type of language that we're using. You might investigate the use of controlled vocabularies or a thesaurus if you've got a very large Web site or a lot of information to organize, but those tend to scale well. A lot of the terms and phrases are often out of date, so you're very often on your own.

Some ideas for organizing and labeling. Go through the card-sorting exercise where you have an index card for each content item. Then you have various groups of people, maybe your staff, management, your audience take those cards and sort them into piles and label those piles and see what you get. See if you're getting some consistency from person to person as you go through this exercise. You might also do a little competitive analysis. Look what other people are doing on the Web, how they are organizing their information in your area. You can make a lot of good use of whiteboards and brainstorming sessions in this area.

Okay, hierarchical organization. Let's see, why don't we take a ten minute break now before we move ahead on into that, and I'll be up here if anyone wants to come up and just ask any sort of questions.

[Tape change]

Peter Morville: Okay everyone, I want to get started again and sort of move into some more specifics. One of the folks in the audience came up and said they were concerned that I was being a little too general. I hope that in this second section I'm going to get a little more specific with some examples and some of these sort of thoughts and broad issues will start to crystallize in your mind.

Hierarchical organization schemes are a starting place for any Web site. In a hierarchy the information is divided into mutually exclusive subdivisions with classes and sub-classes and a parent/child relationship. It's important to recognize up front that hierarchical organization schemes are a very common and familiar way of organizing information. It's how we do our

organization charts. It's how we classify the animal kingdom. It's how library catalogs are organized.

We're very comfortable with organizing that way and as browsers, we're comfortable with navigating through information that way. There is sort of a built-in sense of context. As we get into talking about hypertext, we realize that while hypertext opens up more opportunities, it also creates new problems.

In your Web site, it's important to try to balance the breadth of your Web site with the depth of your Web site. Here we see an example of something that's broad but shallow, a site that's narrow but deep. Some people on the interface design, the "usability community" has done some studies of hierarchies and have come up with some sort of basic rules. To try to limit the number of choices per menu to eight to twelve, at least at the top level. Try to limit the number of hierarchical levels to three or four. When you start to go beyond these numbers, then the browsing breaks down.

You have to rely on searching. You've seen that with *Yahoo*, if any of you are frequent *Yahoo* users. There are so many menu options, so many hierarchical levels that it's very difficult to browse through and find what you're looking for. You find yourself relying on the search engine.

So many studies have indicated that an hourglass structure works best. Give people eight or so options at the top level, then kind of shrink down three or four options at the subsequent levels. And then you can split off into more options, and if you're talking about perhaps an alphabetical product list, then it's no problem with breaking out into twenty-six options at a deeper level. If you're organizing by topic or subject and it's something that's not as easily segmented, then you again want to keep to eight or twelve options if possible.

M: Excuse me.

Peter Morville: Yes.

M: [inaudible]

Peter Morville: Right. If you've got such a large collection of documents and you realize that browsing is not going to be the central way that people access information, you're going to have to put a lot of effort into the design of your search interface. There may be ways to try to facilitate browsing, but with the amount of information that's on a *Yahoo*, that's very difficult.

M: [inaudible]

Peter Morville: Absolutely. As we'll talk about in a few minutes, you want to make sure that your search option is available on the front page and easily accessible from other pages.

Now, I've got hypertext. One of the most exciting things about the Web is this idea of hypertext, that I can click on a word, I can go to another document which might be on the same computer or might be on a different computer. Also the idea of "hyper-media," because a word can take me to an image or an image can take me to another document, to a video clip and so forth. So we're moving between documents and between media.

Hypertext supports multiple pathways to the same information. There are lots of different ways to get to the same place, but with flexibility and opportunity comes some down sides. It can be very disorienting to the user. So in navigating through hypertext it's very easy to get lost. It's not always easy to get back to where you started. That happens across Web sites

but also within Web sites. How do I get back to the top page? Do I really want to click on the back button ten times?

So this places an added demand on the navigational elements. We want elements that will allow us to get back to the key points in our Web site quickly and easily. We want to have a sense of context, to understand where I am in the Web site. So hypertext can be used to compliment the hierarchical organization structure, but you want to make sure that you don't get people lost. Yes?

M: [inaudible]

Peter Morville: Okay. Should we use page numbers and should we tell people how many pages are in your Web site? Page numbers are really going to be most applicable if you are talking about a linear document. Most Web sites are not linear documents. We're going to come into a Web site and there are multiple paths that I can go down. I can choose my own way of navigating, but there may be linear documents within my Web site. I've got my product catalog up there. That might be something that I navigate in a linear fashion. In that case, I do want page numbers and I want the ability to go to the next page and the previous page. I've got a diagram coming up that will show that. Yes?

M: How about the use of an index of the whole site and have that as a selection?

Peter Morville: The idea of an index to the whole site is a great one. It actually sort of refers to the second question, "Do I want how many pages on this Web site?" You want to give people a feel for the size of the Web site. Is this a *Yahoo* or is it five or ten pages that I can get around pretty quickly? So you might want to have a map to your Web site that shows all different locations and where they are. That might be represented graphically with some sort of map or text with some instructions and some description of the various sections of the site.

So here I see a representation on hierarchy and hypertext. Someone can come in at the top level. Yes?

M: [inaudible]

Peter Morville: That's a good question. The content, the organization of information at the user level is also a back-end component. How do we organize the information at the back-end? In that organization it may reflect the organization at the front-end or it may organize information quite differently. You might have all of our documents in one directory. You might have all of our graphics in another directory.

You want to think through that back-end architecture just like we think through the front-end but with different goals in mind. We want to make sure that people who are maintaining the Web site can find a particular document. You want to make sure it's labeled, not as X12.HTML, but as something they can easily find and reference. You might have a table, a relational table or database so that I can type in a key word of the document and I can find where that document is and go in and edit it. I'll talk a little bit more about maintenance, and we might come back to this issue a little later on.

So we come into the structure and we can come through hierarchically but there are also other ways to get to certain sections. We might thwart that hyperlink and click up to that document. That's where you've got to make sure that there's some sense of context. How are people going to know where they are in your Web site when they've clicked on a hyper-link?

The navigational elements are part of the architecture, but they're implemented at the page level and they do have site-wide implications. The goals are to provide that sense of context and consistency, to facilitate browsing and search, and to balance the ability to get anywhere from anywhere with the avoidance of clutter. We don't want a link to every single page of our Web site on every single page. How do we balance those?

We want to take advantage of the consistent use of landmarks. Elements on a page should be organized on each page in a consistent place. We want links to the gateway page, to the main menu, to an index, to various sections, linked to the searching page. This navigation can be done through hypertext links, this text tool. You can use arrows, we can use maps, we can use icons. We'll take a look at a study of some icons in a little while.

Okay, elements on a page. You're going to have a document header, you're going to have a navigation bar, the body of the document. Depending on the length of the page, we may want another navigation bar. Then we want a mega-information area, information about the page and about the site. Somebody prints out your Home Page and takes it in for a presentation. Are people going to be able to find your Web site later on that day? Are they going to know who you are? Are they going to be able to contact you and ask you for more information?

The document header can be used to provide contextual clues through the use of text or graphics. On every page of your Web site, I want to know that I'm in your Web site. What is the organization that is sponsoring this Web site?

Let's borrow some of the graphic elements from the main page and take them onto the subsidiary pages so that we've got that consistency. Maybe textual clues. Let's include the title of your Web site somewhere. Let's have some links showing the position in the hierarchy.

Let me actually switch over here. An example of that is on an information service that we co-sponsor with the University of Michigan, the clearinghouse for subject-oriented Internet resource guides. You see that on the main page we've got that header. As we select the Arts and Entertainment page, then we've got a link that says "clearinghouse" and then Arts and Entertainment so it gives you a sense of the level you're at. If you select a particular guide within the clearinghouse, that text, Arts and Entertainment, becomes a link, a navigational element so we can connect back to the arts and entertainment section. We know we're in a guide that's part of that section. You can also link right back to the top level of the clearinghouse.

Through the use of common elements from the gateway page, the use of size and color schemes — and let me actually switch back there for a second. On the main page, we've got a larger, more prominent graphic. As we move to the subsidiary page we shrink the graphic size to give you the sense that this is not the main page, this is a secondary page but we borrowed the color scheme and the name from the front page to show you you're still in that Web site.

Okay, we want to have a navigation bar. It might be integrated into the header, part of that header graphic. Perhaps your header is a link back to your Home Page, your main menu. You might want to include this navigation bar at the top and at the bottom. When people are reading through long documents they don't want to have to scroll up to the top in order to get back to the main page.

One of the links that you might want to have is certainly the main menu. You should always be able to get back to the main menu. Maybe a link back to the top of the product section or the services section. You want to have a link on each page that takes us to contact information or maybe ordering information.

There is this idea of specific links where we're pointing to those specific sections or we might want to make use of a general navigational bar. Let's take a look at that. Here's an example. As we're moving through this Web site, let's say we're on page two. Where might we

want to go? We might want to move linearly and go to the previous page, page one. We might want to go to the next page, page three. Or we might want to move up a section to products, move up a hierarchical level. So we can do that with the back and forward and up arrows. One second. We've got the length of the main menu and we've got the link to our search engine. This is just an example. You want to go through this sort of process of thinking at each point in the Web site. Where do people want to go and how can we represent those options through navigation? Yeah?

M: [inaudible]

Peter Morville: That's a good question. Don't the back and forward arrows repeat what's on the browser? Well not necessarily. But it can be a point of confusion.

On your browser you've got those back and forward arrows and what those do is, you click on back and it will take you to the last page you were on. You click on forward and it will take you to the last page you were on if you just went back. It's easy to get lost using these back and forwards. They don't necessarily correlate with what we've got here because in this case the back and forward arrows refer to linear movement through a document.

So we've got the product catalog and the next page takes us to the next page in the catalog. That would not be the same as the forward link on the browser. The back link will take us to the previous page of the catalog. That may or may not correlate with the browser's buttons. But you do raise a good point because there's potential confusion there for the user because they're used to using those arrow keys on the browser and now I've got some new arrow keys. We need to think through, is this going to work? Is there some way we can explain these arrows? Shall we have textural clues like next page and previous page? Or should we stick with those links to specific sections and avoid that potential confusion? Yeah?

M: [inaudible]

Peter Morville: Sure. Okay. You raise an interface design question there. Do we want to have our entire product catalog in one Web page?

M: [inaudible]

Peter Morville: There again, it would be parts of the Web site that you do not go through in this linear way if you've got a particular product. Here we've got product one, two and three. Those might all be one page for product one, for product two and for product three and you can scroll down through those pages. Let's say we've gone to the annual report. That's a large document, but you do want to navigate through linearly. I want to read the annual report page by page. Most likely we're going to want to split those pages up so that a user doesn't scroll through one long page but can go from page to page. Then we want to think about how we allow them to navigate, like flipping the pages of a book. In the back, yeah?

M: [inaudible]

Peter Morville: Good question there as well, and I'm glad that we're getting a lot of questions because this is not an easy issue at all and this bar may or may not make sense. The question is, if you click on that up arrow, let's say when you're on page two, where is that going to take you? Could you have gotten to page two from different locations? Very possibly. That might be a good case against using this type of navigation system. Yes?

M: [inaudible]

Peter Morville: That's a good point. With that annual report, do we want to have a table of contents? People might want to go through linearly, but they also might want to jump right to the financials. Let's provide that capability and also the ability to go back to the table of contents. Yeah, in the front?

M: [inaudible]

Peter Morville: Great point. With *Netscape 2.0* there's a couple of new tools that we can utilize for navigational purposes. One is the scrolling menu that we can have available on every page, so you've always got the same options available on each page. Now there is the ledge or the bar that might be used for corporate advertisement but also might be used for navigational tools. So we can have the same bar available on each page. Yes?

M: [inaudible]

Peter Morville: To my knowledge, no other browsers can do that right now. Each came out, *Netscape 2.0* does have that idea of a ledge or a banner built into the proposal specs, so we might expect to see that sometime in the near future.

M: [inaudible]

Peter Morville: Okay. There are some other browsers and we're thinking about that capability. Those are the things we want to keep in mind because the technology is going to continue to evolve, the tools are going to get better and we're going to have other ways of tackling this navigational problem.

When you're doing architecture you also want to involve the marketing team because there's some interplay there. Do we want to have an advertisement as part of our page and if so, let's set it up ahead of time with that in mind. Let's reserve a space for the ad and not stick it in after the fact.

At the broader level, marketing might play into the structure of the Web site itself. It's the idea of billboards. We talked about that dual use of main menus, the flash for sort of keeping things up-to-date, but also as a navigational system. One idea is to split off the marketing and the flash and the up-to-date aspects into billboards.

Let's say our bookstore has a marketing campaign around Colin Powell's new book. Let's create a billboard for that, a sort of Web site or Web page that's not part of our structure and that can come and go with our marketing campaign.

Let's build some flash into that. Let's have some fancy graphics. Let's have a link directly to ordering your copy of Colin Powell's book and also maybe to the main menu. If we've got those types of links coming into a sort of sub-level of the main page of the main site, going into Colin Powell's order screen you want to make sure that the users understand that they're part of this large site and understand how to get back to that main menu.

Let's just take a few minutes now and look at a case study. Let's look at Netscape's page, which is probably familiar to quite a few of you. Let's just critically analyze it and see what they're doing with architecture and navigation.

We're not going to be able to see the whole page on here. That's another sort of navigation issue. Can we see the whole page? Towards the back of your handout I've printed

out that page, so if you want to get a broader look at what we're dealing with you can look on your handout.

What we've got at the very top of this page, you see the Netscape emblem, the "N" coming across the globe and "Welcome to Netscape" inviting us in. There's a number of icons and we're going to talk a little more about icons in a little while. But icons are pictures trying to represent what's within each of these categories. We've got a clickable menu at the top: Exploring the Net, Company and Products, Netscape Store, User Reference, Assistance and Community. As we go down the page, we see that integration of marketing. We've got Netscape downloaded.

We've also got some dynamic information on this page, some press releases, more marketing. Press now to download version 2.0. We've got some navigational menus: Exploring the Net, Netscape Store, Community. One of the things I find confusing about this site is that these menus don't correspond exactly with the menus at the top of the screen, with those icons. That loses me a little bit. What are all of the options for places to go on this Web site? I'd actually have to go through and check off all the different areas and see where the overlap is.

At the bottom they've got a navigational bar. It's nice that they've got that bar there. It's got pointers to some of the major parts of the site, but again it doesn't correspond exactly with these other menus. So I'm a little confused about what all the options are, but I've also got some navigational tools that are there.

I select one of these options; let's select Community. It's got the same Netscape emblem at the top giving us a sense of continuity. Everyone knows what that big "N" is. We've also got an extension of the icon now from the smaller penguin's icon. We've got the larger thing, so it gives us that sense of continuity. We know where we are. Then we've got some content, some marketing, some more navigation. Then we've got that same navigational bar that we had on the front page. So it gives us some consistency and some sense of context. Also notice the information on the bottom telling us that this is Netscape and giving us an e-mail address and a phone number to call for more information.

Does anyone have any comments or questions about the Netscape site? Okay.

Let's talk a little bit about searching the Web site. We want to provide a search interface if our site is larger than ten or so pages. We want to start thinking about applying searching as an alternate means of navigation. What are the things that we can use to allow people to search? There are menu and document titles. Those are very often the best sort of content words, the best key words to search on because we've put a lot of time into labeling each document and labeling each menu. Let's take advantage of that rich vocabulary. Let's use that for searching. But other options: you can full text index the whole Web site, every document people can search. That's easier from the publishers point of view because you can run a full text index across all of your information and update it as you need to. It's not so easy from the user's prospective. It puts a high demand on their ability to use search techniques. We've got a question. Yes?

[Tape change]

Peter Morville: What she's asking is if a certain word or phrase appears several or dozens of times in your Web site and someone searches on that, then they're going to pull up all of those hits and it's going to be frustrating for them to look through. Well, part of that is a labeling issue. When we're labeling documents and titles and so forth, we want to think through the fact that these are going to be searched. We want to come up with unique names, and so a document might say Colin Powell but it also might have something like biography, Colin

Powell's contact information or whatever. So we're adding some clues that will facilitate searching. Yeah?

M: [inaudible]

Peter Morville: Well what I'm talking about here is once we've got that table of contents and it's a very large one, we can index all of the terms within that and provide things like searching on that index. Yes?

M: Isn't part of that problem going to be taken away by searching that you use, in other words [inaudible].

Peter Morville: Okay. You bring up the issue of when other people are going to search your Web site. Let me hold out for a second. The options for you as a publisher of information...what I'm talking about here is, you're providing a search capability as part of your site. You're purchasing a commercial search engine or taking advantage of some shareware. You're controlling how people are going to search your Web site. The options are menu and document titles, full text, and you might take it a step further and develop your own database. Each document might have an author name or key words or a date. You can go that step further and provide some real flexible and powerful searching on your Web site. Yes?

M: I think the issue of one of the earlier questions was getting at it if you've got one document, one page that's about Colin Powell, but you've got eight or nine references across your menus or other reference points on your Web site. If you're searching through those menus you're going to have seven or eight occurrences referring to the same document.

Peter Morville: Sure.

M: We're struggling with this, too, because we're going to have [inaudible] and I was wondering if there's a way that if we sat down at the table and listed every document once that we could search the table of contents and that way we don't give somebody who is searching eight instances of the same thing.

Peter Morville: Right. Thank you for that. That clarifies this issue. If you've got multiple references to Colin Powell but they're all pointing to the same document and you do a search on menu and document titles, you're going to bring up all those references. That's a decision you can make. You can say, "We're only going to provide searching on document titles, or "I'm going to give people the ability to choose whether they search menu or document titles." Or "I'm going to come up with a secondary index that removes all of the multiple references to documents."

There's a lot of flexibility in here.

M: [inaudible]

Peter Morville: Sure. What you're going to find, particularly in the commercial search engines, is a lot of flexibility. The ability to create stop words, words that appear so often that you don't want to even use them for searching. The ability to remove duplicates. So we can do that. What we want to think about is what is the content that we've got, how do we want to do searching?

Then we can make sure that we purchase the right search engine that will accommodate that. Yeah?

M: Is there a list of all the search engines and what the different features are?

Peter Morville: Probably. There's a list of everything. Yes. I would go to *Yahoo* and I would search for search engines or commercial search engines or search tools. I'm positive they've actually got a directory of all the different commercial search tools. It can be pretty confusing to look through and pick out which ones you want because there's all kinds of different features and so forth. That's nothing we can really go into here. But there is a lot of flexibility. You don't want to think too narrowly about what you can do with searching.

You want to put plenty of thought into your interface design. Far too often you get to a Web site and you don't really know what you're searching. Are you searching those document titles, are you searching the full text? Tell the user what they're searching and provide a clear explanation of how it can be searched. Do we have [inaudible] capabilities? Can we use "ands" and "ors" and "nots?" Can we use proximity and adjacent searching? This word has to be near to this word, this word has to immediately follow that word. Are searches case sensitive? Can we use nesting to get really complex searches going? Is there relevance ranking? You mentioned [inaudible] which takes advantage of relevance ranking, so it does a full-text search on the documents and then it provides the hits that it thinks are most relevant to you based on where the terms appeared in the document, whether they were in the title or further down in the body, how often those words appeared.

Other engines are more bullion-oriented and they will give you the hits, only the hits that matched your criterion to tell the user which type of search engine they're using.

You want to have an explicit relationship between browsing and searching, if possible. If people can browse through those menu and document titles and they know they can search those menu and document titles, it's going to give them some clues to the language that you're using and the language that they might use in doing a search.

You want to know how important searching will be on your site. Should you have a novice and an expert option? Are there going to be people that come in and just want to type a word and find something but also people that want to come in and do a very complex query? There's a lot of thought that can go into query interfaces and you want to know how important it is. Let's make sure it's usable.

I'm not going to go into detail on advanced tool design, but it's something you want to think through in the conceptual design phase. If we're going to add registration authentication, what is the interface? Is the first page that people come into a registration screen? Can they get beyond that without registering? Is authentication going to get in the way each time they come to the Web site? Do they need to type their log-in and password each time? Or is there some way to incorporate that with their hot links so they can always get back to your page?

The same thing with on-line databases and conferencing and on-line forums. You want to consider interface design issues, and people from the technical communications fields, interface design and usability and so forth, graphic designers to help with these. Yes?

M: [inaudible]

Peter Morville: Again, I'm sure that there is and *Yahoo* will be the first place to look. Search for conferencing and forums and I'm sure you'll find a directory that addresses some of those.

Okay, we want to put our Web site through some usability testing, some prototyping. Let's create those main pages, let's set up the templates for some subsidiary pages and let's test

in on some of our intended audiences. One way to test it might be to have people sit down at a computer with your prototype and have them talk out loud as they try to navigate through your Web site. "Okay, I'm trying to find your products. I'm clicking on this menu. I'm lost now." Capture that on tape and analyze where are people getting lost, what things are working and what aren't.

Let's make sure that they're trying some different types of searching. Let's have some people just casually browsing your site and let's give some people some directed searches to make sure that we're supporting both. Then let's go to the redesign.

With usability in mind, we're going to switch over to another case study. Sun Microsystems put a lot of time and effort into designing their internal Web site. They've got some experts there in user interface design that were involved in this process. We're going to take a look at their use of icons and just talk a little bit about how those work, but the URLs on your handout, I'd invite you to take a look at that URL sometime later and read through their paper on how they designed their Web site. It's very interesting.

While that's loading, I'll just point out that they've got their bar on top there, a couple of navigational elements, icons. One looks like a house, probably to the Home Page. Another with a magnifying glass, I guess a search, linking to the search interface. Are those easy to understand? Relatively so. You need to think it through, and we're going to take a look at how they went through coming up with some of these icons.

Here are some examples. We see at the top, these are actually their final product, their final icons after they'd been through several iterations. They developed an icon and then had people look at their image and say what came to mind to determine whether it was in sync with the intended meaning.

At the top here we've got a picture of the earth and the intended meaning. Here is a geographic view of the company and the fact that there are branch offices in different locations. Clicking on that would take us to the branch offices. The users interpretations were things like: it's a world, it's a global view, it's a planet. So we're in the same ballpark there. With the benefits package being the intended medium, interpretations were help field, money, health care is expensive, Clinton's health care plan, hospital, don't know, benefits.

We're getting sort of a wider range of thoughts here. It's not clear to all of the users what happens when they click on that icon. For the television set, which is meant to represent public relations, everyone just said TV. They took the physical representation for what it was. They tried to represent the product catalog with a computer and a CD-ROM. People said systems-oriented, disk, CD, computer CD, CD-ROM. So people are sort of taking a literal interpretation.

With this tool box, specialized tools, people thought it was a briefcase, linked to personal information, a toolbox and a briefcase again.

Let's just take one more here. I've got this bulletin board. It's a "What's New" bulletin board. That's what it's meant to convey. Most of them said it's a bulletin board. One person said it's the laundry. So what we're seeing here with icons is that even when you put them through a lot of testing and iteration and redesign, you still have differing opinions of what they might link you to.

You can take your own lesson from that. The lesson that I took is, I found it to be useful, but not necessarily the first time you come to the Web site. The first time I come to their Web site and I see that bulletin board, if I'm the person that thinks it's laundry it can be pretty misleading for me. But if that's complemented with some text that tells me that this is a bulletin board, the next time I come back to that Web site, hopefully I've associated that picture with a bulletin board and I don't even take the time to read the text. That's the thinking

behind icons. So I can't tell you whether you should or shouldn't use icons, but there are plenty of problems involved and people have comments about that.

M: What if you use the icons on the first page with the text and then on subsequent pages you just have the icons?

Peter Morville: Sure. Once you've sort of built in that connection between the icon and what you're trying to convey, then you might take advantage of those icons on subsequent pages without the text. You want to go through some testing to make sure that it does click in people's minds soon enough. Yeah.

M: [inaudible]

Peter Morville: Right. People might connect right directly to that page and skip through the part where it tells you what the icon means. Yes?

M: How about something on there that's very obvious? I think one icon that seems to be the common universal is a question mark for help.

Peter Morville: Right.

M: Having a help screen, which then does explain the icons.

Peter Morville: Right.

M: So they can always click that.

Peter Morville: Right. Coming up with a Help button using the question mark, which is a pretty common use, clicking to describe the icons. Yeah?

M: [inaudible]

Peter Morville: Right. A suggestion to have text alternatives so you don't have to rely on the icons. Another thing that icons introduce is sort of growth or extension issues. It might come upon your top page with five icons that all really make sense and work. Then six months later you say I want to add another category and I can't think of an icon. Well what do you do then? So you want to think to that idea of growth, too.

Moving into the planning for production phase, how will the Web site be implemented? We want to go through some needs analysis and some resource identification. What do we have at our disposal already in terms of people and technology and content and so forth? What do we need that we don't have?

The technical and architecture teams want to think through that information ownership blueprint. Who has the content now? What format is it in? Are the same people that own and create the information going to be the people that manage the information on-line? Process ownership; how is it going to get from that original state into the Web site? Are we going to have a centralized or decentralized model? Should it all go to a Webmaster? Just send all of your print documents to the Webmaster and they'll put in on-line. Or do we want to have the people that are creating the content publish it on the Web at the same time? We want to

rethink the way that we're creating content in the first place so that it fits in with this new medium.

How much information do we already have in digital format for the information that's in print form? What is the cost of conversion versus data entry, optical scanning and so forth? Do we want to do it in-house or do we want an outsource? Do we want to train people in our organization to do HTML? Do we want to create an interface for them to enter content without having to know HTML, taking advantage of those templates? Or is it better just to outsource it, maybe in the development phase to outsource it and in the maintenance phase we start to have people coming up to speed.

Throughout all of this is project management, the planning through production that's really important. We want to think through the dependencies and the opportunities for parallel processes. Can we have the technical team making the server ready and implementing some of those advance tools while the design team is designing the graphics and doing the page layout?

We want to make sure that we're on time and keeping within the budget. So we move into production, as I mentioned. Ideally it's painting by number, but in reality it's crisis management. We thought it was going to work this way, but all of a sudden we've found out that the conversion isn't working properly, we can't really get our hands on this content. We found out it's copyrighted by someone else. So we're working out all of the real issues and making things happen and working through those parallel processes.

What are the things that we can be doing that we want to have done when the Web site it up? Should we start training staff now? Who is going to have to know what? Do we need to create documentation so that we can manage this information over time?

We can start data testing. First, let's have the teams run through our prototypes and make sure things are working. Then let's start getting some of the customers in, seeing what is happening and redesigning based on the feedback.

At some point we're going to want to launch our Web site, but we don't want to do it too early. There's a lot of Web sites out there with construction signs or empty menus. On the Web, just like everywhere else, you only get that first chance to make a first impression. When I go to a Web site and see a bunch of construction signs and there's nothing interesting, it's going to take a lot to get me back there again. So you want to be careful not to launch too early, but you've got to balance that with the demand to show that you're moving in this direction. And you want to make sure that — yes?

M: [inaudible]

Peter Morville: How often do you launch different versions? Well, the way that I'm using the term launch is sort of from the very beginning saying if the organization doesn't have a Web site, there's going to be that time when you launch it. You want to make sure that you've got enough there and that it's well designed and that you don't have a lot of empty back alleys before you launch. But then this is where marketing ties in. Are we going to have product launches in our Web site? Are we going to have another marketing effort every six months? Are we going to publicize on the Web and in our print literature? We want to make sure that we take advantage of integrating the traditional and the new marketing tools. Yes?

M: Another issue that comes to mind is how often you refresh and revitalize the content that's there. If you just put up a Web service and it stays stagnant for three or six months, nobody is going to come visit you.

Peter Morville: Right.

M: People will...you want it to have something dynamic that causes your customer base or the audience you to serve come back to you every week or every two weeks, in some places everyday.

Peter Morville: All right. You make a good point that you want to make sure that your site has some dynamic component, that there's a reason for people to come back. You want to make sure that the procedures for maintaining the currency of your information are in place before you launch so that you're not going to launch and then spend six months figuring out how you're going to keep that "what's new this week" section up-to-date. These are things you want to think through before you launch.

With marketing, take advantage of traditional channels: press releases, advertising, print literature, business cards and so forth. But think about how you can also leverage some of the marketing tools on the Web. Let's make sure that we post to all of the directories, the *Yahoos*, the "I"-Nets, open markets and directories of commercial services.

There are some Web sites that brought a lot of these directories together. There's one page to post to everywhere; I can't remember it offhand but *Yahoo* is probably a good place to look for it. How about discussion groups? Are there communities of people that might be interested in your products?

Here you've got to think real carefully about Medi-Cal. Am I going to get flamed if I post to this community? Or maybe do I have some interesting content, a value-added service that I can relay to these communities. I'm providing a valuable service to you, here this is the URL, but they're going to link back to your Web site as well. So are there ways to leverage these on-line communities?

And then on-line advertising. It's really just taken off this year with *Yahoo* and *Pathfinder* and *GNN* and so forth. I think the attraction there is that the people who are seeing those ads are already on-line, they're already on the Web and you can have a direct link from *Yahoo* to your Web site. So there's a smoother connection between reading the ad and connecting to your Web site. You want to think through the costs of that as well. Yes?

M: [inaudible]

Peter Morville: That's a tough question about time frame, and another one that is similar is cost. Someone asked me during the break. It can just be all over the board. From getting our Web site up in three months, a large-scale Web site, it's hard to picture doing that in less than three months, although probably some of you have done it.

But let's take three months as being the short timescale. It's enough time to get these teams together and move through these phases. It's a pretty frantic pace, but it can be done. On the longest scale, six months to a year. It's hard to see going that long. It seems like you're dragging things out. So maybe three to six months is a good range for taking your first attempt at doing it in a way that represents your organization well. With costs all over the spectrum from a couple of hundred dollars to have a college student put your Web page up to five to ten thousand to put up a real basic site that's done professionally to several million dollars for a Web site. There are Web sites that people have put several million dollars into.

M: What would be an example of a several million dollar Web site?

Peter Morville: Probably *Pathfinder*, although I don't know that for sure. There's an organization in the Boston area that's putting up *Barrons Financial Magazine On-line* and that's in the several

millions of dollars. They tie in a lot of back-end information so that as you read through the magazine you have access to lots of sources of historical financial information, but that's an example.

Okay, with maintenance you want to keep your content fresh and up-to-date. If you designed it separating the static from the dynamic information, users know where to come to look for the newest most up-to-date information.

As I mentioned earlier, maintenance is a little bit of a misnomer because the site is going to grow and evolve over time. You want to respond to user feedback. People are finding it hard to find this particular type of information that's important to them so you want to redesign based on that. You want to grow. It's going to be more information over time that you might want to make available. The first iteration of our Web site might only be the beginning. Hopefully we've designed the architecture so it will scale up, but in some cases that's impossible.

We want to evaluate success. What are our metrics of success? That depends on our goals in the beginning, what we hope to achieve. Were we trying to get a return on our investment? Were we trying to do sales, or was this more of an image thing?

Some tools for evaluation: the most basic ones are the standard usage logs that tell you the host computer that the people came from and that sometimes gives you an indication of who is looking, if it came from a commercial or a government or an educational or a non-profit site, and if it came from the U.S. or Canada or Japan or Sweden.

If you want to go beyond that, try assessing the demographics of people that are coming into our Web site and find some way of surveying the audience. That's when the registration and authentication comes in. It imposes something of a barrier to access. It might reduce the numbers of people using your site and cause some frustration, but it also allows you to tap into who is coming to the Web site and what they earn and what company they are from, the demographics. How often are they visiting, how long are they staying? If you've got content that's attractive enough that people want to get it, they'll go through that extra step. But if you don't, you've got to be real careful.

You might try contests and so forth to draw them in — every hundredth user wins a prize or something like that. People in marketing departments have found all sorts of ways to find out who is using their print products and how successful they're being. You just want to take some of those and see if they apply to the on-line medium.

So we've got lead tracking — how many people have come into the Web site, who are they and what is the result. Are they making follow-up calls, are they asking for our product catalogs, are they actually buying our products? There are no quick or easy ways to do this, but there are ways to make it happen and those are really not any different from the traditional sort of marketing world. From your Web site you've got a phone number with an extension that's unique to that Web site, so you know that a phone call came from the Web site and so forth.

So just to review, we talked about this intra-disciplinary team approach with the architecture and design and marketing and technical and project management teams all working together. From working through these phases, from research to conceptual design, planning for production, to production, to maintenance, and redesign and growth and so forth.

We've talked a little bit about evaluation, the different ways to look at this. First of all, a lot of the ideas behind design are not going to change. Coming out of those technical communication and interface design fields, there are a lot of rules and ways that we know to organize information to make it usable. But the technology is going to keep changing. Today it's HTML, but now we're seeing *Java* and *VRML*, and Microsoft has a technology called *Blackbird*

that's sort of like HTML but very different and might compete with HTML and might replace HTML or might never really take off. We'll have to see.

You need to keep up with the technologies and understand what we can do and then we want to make sure that what we do makes sense from a design and an architecture point of view as well as marketing.

At the back of your handout there are some Web design resources, things that I found interesting or instructive about this topic. I'd just like to point out one of them that I would really encourage you to take a look at and that's the *Word-Wide Web Style Manual* from Yale. It's very interesting to read through and it covers a lot of the topics that we've covered today.

So you want to keep up-to-date, take a look at some of these resources and you might want to hire a consultant. I'm happy to talk with anyone afterwards about that option.

Just as I brought up that consultant idea, you might want to do some of this in-house and you might want to do some of it externally. You want to look at what you have in-house and then think about what you need to bring in, who you need to bring in to make this happen. You might have technical communications people and interface design people already in house and you might need to bring someone in with a technical background or vice versa.

So these teams that I talked about might be part of those teams might be internal and part of them might be external.

That's all I have for today, but I'd be happy to take questions for awhile up here and then afterwards by the site. Any questions right now?

M: Yeah. Let me ask you a real basic question.

Peter Morville: Sure.

M: I'm putting together a whole shopping list of the components that I would require on a Web site internal to the corporation and internal to my own mainframe design. Of course you need a Web server, a software environment, you need a search implement of some sort and I think you need some programming interface languages like [inaudible].

Peter Morville: I've got a comment to make and then we'll see if there's any other suggestions from people. When you're going about developing a site for your organization, you don't have to go with an internal Web server. You don't have to buy a Sun workstation and hire someone to manage it and get your T-I connection. There are options from Internet service providers to get what is called "virtual host service." Essentially you can lease space on a machine and have your own domain names so that to the outside world it looks like you're running your own server, but you can do that for a couple of hundred dollars a month, and maybe do that in the beginning as a trial and then see if it makes sense, see if there's any need to make it internal.

M: This site is behind the firewall.

Peter Morville: Okay.

M: This is for a corporate communication.

Peter Morville: Okay. So for a large corporation where you've got the firewall needs and the security, you're obviously going to want to do it internally. So does anyone have any suggestions to add to that list?

M: [inaudible]

Peter Morville: Right. Graphics tools and people to do the graphics.

M: Do you have some recommendations on graphics tools to use?

Peter Morville: That's not my area of expertise. The only thing I've used is Adobe *PhotoShop*.

M: [inaudible]

Peter Morville: I'm not sure. I don't know the answer to that.

Okay, well thanks everyone for coming. Hope you enjoyed the conference and I'll be around for a little while if anyone has any questions for me.

AT&T INTERCHANGE ONLINE NETWORKSM MEMBER AGREEMENT

AT&T Interchange Online NetworkSM (the "Network") is an online information and communication service, used by connecting your receiving and transmitting equipment (normally a personal computer with a modem connected to your telephone line) and client software used on your computer to the Network's telecommunications and computer facilities. The Network is operated by Interchange Network Company ("INC").

By completing the enrollment process you become an authorized user of the Network (a "Member"). You must agree to all of the terms and conditions contained in this Agreement and in the Network Operating Policies (the "Operating Policies") in order to become a Member, and continued acceptance of this Agreement and the Operating Policies is a condition of membership. The Operating Policies will follow this Member Agreement; scroll through the Member Agreement to view the Operating Policies.

BY COMPLETING THE ENROLLMENT PROCESS, YOU AGREE TO THE TERMS OF THIS AGREEMENT AND THE NETWORK OPERATING POLICIES, JUST AS IF YOU HAD SIGNED THIS AGREEMENT. IF YOU DO NOT WISH TO BE BOUND BY THIS AGREEMENT AND THE OPERATING POLICIES, PLEASE DO NOT COMPLETE THE ENROLLMENT PROCESS.

1. Membership Restricted to Individuals. Membership in the Network is restricted to individuals. INC may enter into billing arrangements with employers and other entities to pay the charges incurred by Interchange Members and to guarantee that the Members covered by such arrangements will abide by the terms of this Agreement and the Operating Policies. However, each Member, regardless of billing arrangement, must agree to abide by this Agreement and the Operating Policies.

2. Software License. The software provided to the Member to access the Network, and any enhancements, modifications or revisions thereto (the "Software"), are all copyrighted works registered under the U.S. copyright laws. The Software is licensed to the Member by INC only for Member's use in conjunction with Member's activities on the Network. INC retains ownership of the Software at all times. The Member may not assign or transfer his or her Membership or any of the files installed pursuant to the installation program. The Member may copy and distribute copies of the original program diskette and installation program. The Member may not decompile, reverse engineer or disassemble the Software or any part thereof or any manuals or documentation related thereto. This license will terminate automatically whenever membership in the Network is terminated for whatever reason.

3. Payment. Unless Member is accessing the Network via a multi-user corporate account, Member agrees to the following payment terms: Member agrees to pay all fees, connect time charges, minimum charges and other charges incurred by Member or on Member's account at the rates in effect during the billing period in which the charges were incurred, including charges for any purchases made through the Network and any surcharges incurred while using any supplemental networks or services other than the Network. Member shall pay all applicable taxes relating to use of the Network by Member. All payment shall be made by Member in accordance with the provisions of the billing option selected by Member. Member's right to use the Network is subject to any limits established by the relevant Network service to which Member is subscribing (a "Network Service"), INC or by Member's credit card issuer if Member's account is billed to a credit card account. Each Network Service reserves the right to

change the amount of any fee or charge for that Network Service, and to institute new fees or charges, effective upon thirty (30) days notice to its Member.

4. Equipment. Member must provide, at Member's own cost, all telephone and other equipment and services (other than the Software) necessary to access the Network.

5. Operating Policies. The Operating Policies of the Network set forth the rules that govern Member activity on every Network Service. As they may be amended by INC from time to time, they are a part of the contract between INC and Network Members. INC reserves the right to change the Operating Policies at any time without notice to Member; however, notice of any changes to the Operating Policies will be published on the Network promptly upon implementation of the change. The Operating Policies can be viewed on screen at any time by clicking on the "Operating Policies" icon in the Member Support area. Member's failure to comply with the Operating Policies may result in termination of Member's membership.

6. Disclaimer of Warranty; Limitation of Liability. INC makes no warranties with respect to the Software, any documentation provided with the Software, or any services performed by the Software and/or information contained therein. No publisher of any Network Service (a "Network Publisher"), dealer, distributor, agent or employee of INC has the right to increase the scope of this warranty, and no oral or written information or advice given by any Network Publisher, or INC's dealers, distributors, agents, or employees shall create a warranty or in any way increase the scope of this warranty.

Neither INC nor any Network Publisher warrants or guarantees the accuracy or completeness of any Network database or any information published or accessible on the Network, including information in any Network Service. Although INC and Network Publishers intend to take reasonable steps to screen uploaded files for infection by viruses, worms, Trojan horses or other code manifesting contaminating or destructive properties before making such files available for Member downloading, neither INC nor any Network Publisher can guarantee that any file available for downloading will be free of infection. Accordingly, INC and its Network Publishers cannot and do not guarantee or warrant that such files will be free of such properties. The entire risk as to the quality and performance of the Network, the quality of any related services, and the accuracy of any information, or quality of any software published on the Network is with the Member.

INC does not warrant that the functions or services performed by the Software or the Network will be uninterrupted or error-free or that defects in the Network or Software will be corrected. The Network and the Software are provided on an "as is, as available" basis. Neither INC nor any Network Publisher makes any warranties, express (except as expressly provided herein) or implied, including, without limitation, those of merchantability and fitness for a particular purpose, with respect to the Network, the Software, any Network Service, any information or software published on the Network, or any products or services sold through the Network.

In no event will INC or its Network Publishers be liable (i) for any incidental, consequential, or indirect damages (including, but not limited to, damages for loss of business profits, business interruption, loss of programs or information, and the like) arising out of the use of or inability to use the Network, the Software, the disk(s) on which the Software is recorded, or any information, software, or any services provided on the Network or downloaded from the Network, even if INC, a Network Publisher, or their respective authorized representatives have been advised of the possibility of such damages, or (ii) for any claim attributable to errors, omissions, or other inaccuracies published on any Network Service or any software contained in any software library contained in any Network Service and/or downloaded from any Network Service.

Because some states do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you. In such states, INC's and its respective Network Publishers' liability is limited to the greatest extent permitted by law.

Each Member is responsible for implementing sufficient procedures and checkpoints to satisfy his or her particular requirements for accuracy of data input and output, and for maintaining a means external to the Network for the reconstruction of any lost data.

7. Reproduction of Information. Member may not reproduce, redistribute, retransmit, publish or commercially exploit any information, software or other content which Member receives through the Network, unless that action is expressly permitted under the Operating Policies.

8. Indemnification. Member agrees to indemnify, defend and hold harmless INC, its affiliated companies, licensors, employees, agents, Network Publishers and any third party information providers to the Network from and against all losses, expenses, damages and costs, including reasonable attorneys' fees, resulting from any violation of this Agreement (including the Operating Policies then in force), or any activity related to Member's account (including negligent or wrongful conduct) by the Member or any other person accessing the Network using the Member's Network account.

9. Third Party Rights. The provisions of paragraphs 6 (Disclaimer of Warranty), 7 (Reproduction of Information), and 8 (Indemnification) are for the benefit of INC, Network Publishers and their respective non-Member licensors, employees, agents and any non-Member third party information providers to the Network. Each of these individuals or entities shall have the right to assert and enforce those provisions directly against a Member directly on its own behalf.

10. Termination. This Agreement, the license provided herein, and Member's right to use this Network and the Software may be terminated at any time for any reason without notice by INC or Member. The provisions of paragraphs 3 (Payment), 6 (Disclaimer of Warranty), 7 (Reproduction of Information), 8 (Indemnification), and 9 (Third Party Rights) shall survive any termination of this Agreement.

11. General Provisions. Any provision or condition in any purchase order, voucher or other memorandum received by the Member in connection with the Network which is in any way inconsistent with, or adds to, the provisions of this Agreement is null and void. Neither the parties' course of conduct or trade practice will modify the terms of this Agreement or the Operating Policies. If any provision of this Agreement or the Operating Policies is determined by a court of competent jurisdiction to be invalid, all other terms and conditions shall remain in full force and effect.

12. Governing Law. This Agreement, the relationship between Member and INC resulting from this Agreement, and the resolution of any dispute arising out of that relationship shall all be governed and construed in accordance with the laws of the Commonwealth of Massachusetts applicable to agreements made and to be performed in Massachusetts. Member agrees that any legal action or proceeding between INC and Member for any purpose concerning this Agreement or the parties' obligations hereunder shall be brought exclusively in a federal or state court of competent jurisdiction sitting in Suffolk or Middlesex County, Massachusetts. Network Publishers shall have the right to determine jurisdiction of any dispute between that Network Publisher and any Member by notice to that Member.

13. Restricted Rights. The Software is provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by employees of the Federal Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of The Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 or in subparagraphs c(1) and (2) of the Commercial Computer Software – Restricted Rights at 48 CFR 52.227-19, as applicable. The manufacturer of the Software is AT&T Interchange Online Network, 25 First Street, Cambridge, MA 02141.

14. Restrictions on Export of Software. Member shall not, directly or indirectly, export or reexport the Software to any of the following countries: Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Cambodia, Cuba, Estonia, Georgia, Iran, Iraq, Kazakhstan, Kyrgystan, Laos, Latvia, Libya, Lithuania, Mongolia, North Korea, People's Republic of China, Romania, Russia, Syria, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam, or Yugoslavia. The terms "export" and "reexport" mean transferring or releasing to another country or to a national of another country the Software by any means -- physical, electronic or otherwise. In the event that Member's membership to the Network and Member's license to the Software are terminated for any reason, Member shall continue to be bound to the restrictions on export contained in this paragraph.

15. Trademarks. AT&T, Interchange, and Interchange Online Network are service marks of AT&T. All rights reserved. All other trademarks appearing on the Network are owned by their respective companies.

AT&T INTERCHANGE ONLINE NETWORKSM

OPERATING POLICIES

AT&T Interchange Online NetworkSM (the "Network") has as its goal the transmission and exchange of useful data and the establishment of a community of members sharing and contributing to that data. Interchange Network Company ("INC"), the operator of the Network, has established policies to govern all members' conduct on the Network. These policies are subject to revision at any time by INC, but INC intends to notify all members over the Network promptly of any changes. Your acceptance of these policies is a condition of membership. Your failure to comply with these policies may result in termination of your membership on the Network.

1. Membership Requirements.

You must be an individual at least 18 years of age to enroll as a member (a "Member") of any service published on the Network (a "Network Service"). You must enroll on the Network under your own name. Please inform INC promptly if there is any change in the information which you provided to INC at the time of enrollment, including change of address and any credit, debit or charge card numbers and expiration dates.

The Network and your membership are to be used only by you and members of your immediate family. Unless you have INC's express written consent, you may not resell, assign or transfer your membership to anyone else. You may not permit any person other than yourself or your immediate family members to access the Network for any purpose using your name or account. You are personally responsible for all use of the Network under your account identification number ("ID") (including payment for any orders of goods or services from any Network Service or third party vendors and including liability for any harm caused by any material uploaded to any part of the Network).

2. Fees and Payment.

You must elect a method of payment at the time of enrollment. You are responsible for all charges (including applicable taxes) to your account. All fees and charges are payable in accordance with billing terms in effect at the time the fee or charge becomes payable. Current fees and charges are posted in the Member Support area of the Network. Each Network Service reserves the right to change the amount of, or basis for determining, any fees or charges for that Network Service, and to institute new fees or charges, effective upon thirty (30) days notice to its Members.

You are responsible for providing and maintaining the communications equipment (including personal computer and modem) and telephone services required for connecting and using the Network. INC will provide telephone numbers for connecting to the Network. You are responsible for all telephone fees and charges, including per-minute, unit surcharges and equipment, or line costs incurred by you, associated with the use of the telephone number(s) selected. Any disputes or problems regarding phone service are strictly between you and your local phone company or long-distance service provider.

If you have reason to believe that your account is no longer secure (i.e. in the event of a loss, theft or unauthorized disclosure or use of your ID, password, or any credit, debit or charge card number stored on the Network), you should promptly change your password and inform INC of the problem to avoid possible liability for any fraudulent charges to your account. Until INC is notified (by notice given as described in Section 4 or by telephone at 1-800-299-9699), you will remain responsible for any unauthorized use of the Network occurring under your ID.

3. Member IDs and Passwords.

Upon your enrollment as a Member, you will choose a unique ID; in addition, you must also choose a password at the time of enrollment. You must use both your ID and your password in order to gain access to the Network. Anyone who knows both your ID and your password can gain access to your personal information and misuse it (and incur charges which you may be responsible for), so all Members are advised to keep their passwords secret. You are advised to choose a password that is not obvious (for example, do not choose your name as a password), and we also advise you to change your password frequently. Instructions regarding changes to your password are posted in the Member Support area of the Network. If you forget your password, INC will disclose it to you as long as its security procedures are met.

You may not use another Member's ID. Unauthorized use of another Member's ID or password are grounds for termination of your Membership, and may be a violation of law.

4. Notice.

INC may deliver notice to Members by means of: electronic mail on the Network, a general notice on the Network, or by written communication delivered by first class U.S. mail to each Member's address on record in INC's account information. You may give notice to INC at any time:

- (i) via electronic mail to Member Support;
- (ii) by letter telecopied to INC at the following fax number: (617) 252-5525; or
- (iii) by letter delivered by first class postage prepaid U.S. mail or overnight courier to INC at the following address:

AT&T Interchange Online Network Member Support
25 First Street
Cambridge, MA 02141

5. Information on the Network.

It is the policy of the Network to encourage candid, open discussion of topics of interest to Members. Members should feel free to express their views and to be accountable to their fellow Members for those views.

Unlike print publications, however, Member participation in discussions on any Network Service and in communications with other Members through electronic mail occurs in real time. INC cannot and does not intend to screen Member messages in advance. In order to maintain a service that meets the needs of the Members and avoids the harm that can result from the publication of statements that are false, malicious, or violative of the rights of others, it is necessary to establish certain rules to protect against abuse. Disregard for these rules may result in the removal of uploads from the Network and/or termination of Membership.

- (i) Except where and when specifically permitted by a specific Network Service, you may not upload any messages, data or programs anonymously or under a false name. Nor may you permit any other person (other than a secretary, assistant or other agent acting on your behalf and subject to your supervision) to access the Network for any purpose using your account or ID.
- (ii) Members may not upload any information which is libelous, defamatory or which discloses private or personal matters concerning any person. Members may not upload any messages, data, images or programs which are obscene or pornographic.
- (iii) Members may not upload any messages, data, images or programs that would violate the property rights of others, including unauthorized copyrighted text, images or programs, trade secrets or other confidential proprietary information, and trademarks or service marks used in an infringing fashion. Please refer to Section 9 (Copyright and License) of these Operating Policies for further information regarding copyright rights in material uploaded to the Network.
- (iv) Members may not upload any files which contain viruses, worms, “Trojan horses” or any other contaminating or destructive features.
- (v) Members may not use the Network as a forum for “hate speech.” It is not the Network’s intent to discourage Members from taking controversial positions or expressing vigorously what may be unpopular views; however, the operator of each Network Service (a “Network Publisher”) reserves the right to remove uploads containing racial, ethnic or religious slurs or similar epithets, or advocating violence, or other language that is deeply and widely offensive. In addition, each Network Publisher reserves the right to take such other action as it deems appropriate in such cases, including the termination of membership.
- (vi) Except where expressly permitted by a Network Service, Members may not publish on or over the Network any information, software or other content which contains any charity requests, petitions for signatures, advertising or any solicitation of other members to use goods or services, without prior express approval of the relevant Network Publisher.
- (vii) Members may not use the facilities and capabilities of the Network to conduct any activity or solicit the performance of any illegal activity or other activity which infringes the rights of INC, any Network Publisher, other Members, merchants or information providers on the Network.

In light of its policy of encouraging candid, open exchanges of views by its Members and the rapid distribution of information originating from many sources, Network Publishers cannot determine in advance the accuracy of information that may be uploaded to the Network.

Accordingly, Network Publishers cannot and do not guarantee the accuracy or completeness of any database on the Network, of the information contained in any such database or of any statement uploaded to the Network by any Member.

Neither INC nor any Network Publisher endorses or is responsible for any statement, opinion, advice given or made on the Network by anyone other than authorized INC and/or Network Publisher spokespersons. Experts and sysops on the Network are not authorized spokespersons.

Opinions, advice and all other information expressed by Network Publishers and information providers represent the providers' own views and not necessarily those of INC, and Members rely on such information at their own risk. Members are urged to seek professional advice for specific, individual situations and not rely solely on advice or opinions given on the Network.

Neither INC nor any Network Publisher guarantees that any software uploaded to and published on the Network will be free of viruses, worms, "Trojan horses" or other contaminating or destructive features, although INC and its Network Publishers intend to take reasonable steps to attempt to screen such uploads before making them available for downloading. There is no fail-safe screening procedure that will catch all destructive code and INC and its Network Publishers cannot and will not be responsible if any such code passes through the screening procedures that INC or a Network Publisher follows and infects a Member's computer.

6. Electronic Mail.

Electronic mail ("mail") is a private electronic message sent by a Member or by INC or a Network Publisher to another Member or user of the Network. Once it has been read, it is retained by INC for seven (7) days. UNREAD MAIL TO MEMBERS IS AUTOMATICALLY DELETED THIRTY (30) DAYS AFTER THE DATE SENT. INC will retain unread mail for any canceled Network account until (a) the account is re-opened and the mail is read, (b) thirty (30) days after the mail was sent, or (c) thirty (30) days after the date the account is cancelled, whichever is earliest.

INC will not intentionally inspect the contents of mail sent by one Member to an identified addressee, or disclose such contents to other than the sender, or addressee, without the consent of the sender or the addressee, unless: (a) INC is required to do so by law (for example, in response to a lawful subpoena or court order), (b) such inspection or disclosure is necessary for the provision of mail service (for example, in connection with system maintenance or disaster recovery) or to the protection of the rights or property of INC, or (c) the mail is disclosed to INC by the recipient or the originator of the mail.

The rules of the Network prohibit any Member from harassing other Members with unwanted mail messages, including messages that are obscene, offensive or otherwise inappropriate or that are sent after the sender learns that the recipient does not wish to receive such messages. Members who receive such messages are encouraged to forward such messages to Member Support with any pertinent information concerning them. By forwarding mail message(s) to Member Support, a Member consents to review by INC personnel of original database records of the mail message. Following such review, INC will consider the complaint and take such action as INC, in its sole discretion, may deem appropriate.

INC, at its sole discretion, reserves the right to immediately terminate, without notice, the membership of any Member of any Network Service who misuses the Network's electronic mail.

7. Discussion Areas.

The content of any statement or information which is transmitted for posting in a discussion area should be consistent with the rules set forth in Section 5 (Information on the Network) of these Operating Policies and not violate the rights of others.

Each Network Publisher reserves the right to attach to any uploads related or opposing viewpoints, responses or other information as the Network Publisher in its sole discretion deems appropriate. Members who believe that a contribution to a discussion area violates the rules set forth in these Operating Policies are encouraged to contact either the system operator ("sysop") for the particular discussion area or Member Support. Violation of these rules may be the basis for termination of Membership.

Although Network Publishers and sysops monitoring Network discussion areas do not intend to engage in any prior review of member notes posted to discussion areas, each Network Publisher reserves the right in its sole discretion to edit, delete or redirect any information, software or other content uploaded to that Network Service (including Member uploads to discussion areas), regardless of whether the information, software or other content violates the rules for content described in Section 5 of these Operating Policies.

8. Software Libraries.

The Network and each Network Service may maintain software libraries ("Software Libraries") for Members' use. INC maintains all Software Libraries located in the "Interchange Central™" part of the Network ("Core Software Libraries"). Network Publishers maintain all Software Libraries on their respective Network Services. In connection with uploads to a Software Library, the uploading Member will be required to complete an information form regarding the uploaded data. The executed form constitutes an agreement that (i) the uploading Member either is the copyright holder of the uploaded data or has any copyright holder's express permission to contribute the data to the Software Library under the terms set forth in the Operating Policies, (ii) uploading the data and permitting Members to download it from the Software Library will not violate the copyright, trademark, trade secret, ownership or other rights of any person, (iii) the uploading Member will indemnify and hold INC and the relevant Network Publisher(s) harmless from any and all liability resulting from INC's or such Network Publisher's publication, distribution or redistribution of the uploaded data or the use of the data by any person (including liability resulting from any virus, worm, "Trojan horse" or other contaminating or destructive feature of the data), and (iv) that INC and the Network Publisher obtains the rights in the data set forth in Section 9 of the Operating Policies. INC and each Network Publisher reserves the right, in its sole discretion, to refuse posting of uploaded data in any Software Library, and to remove such data from any Software Library as it deems appropriate.

Each Network Publisher will take such steps as it deems appropriate to screen uploaded data for infection by viruses, worms, "Trojan horses" or other contaminating or destructive features before making such programs available for downloading. Because of the variety of such programs and the limitations in available virus detection tools, there is no way to be certain that a Network Publisher's screening procedures will be effective in every instance. **Neither INC nor any Network Publisher, therefore, warrant or guarantee that data made available for downloading from the Network and/or any Network Service will be free of viruses, worms, "Trojan horses" or other contaminating or destructive features, and no Network Publisher will be responsible for any damages or harm attributable to such features. Each Network Publisher encourages all Members to scan for viruses all programs they intend to load, including programs downloaded from any Software Library.**

Each Network Publisher, at its sole discretion, further reserves the right to terminate the membership of any Member who fails to comply with the rules for the Software Libraries.

9. Copyright and License.

The entire contents of the Network are copyrighted as a collective work under the United States copyright laws. The owner of the copyright in the collective work is INC. The entire contents of each Network Service are also copyrighted as a collective work under the United States copyright laws. The owner of the copyright in each collective work is the Network Publisher of that Network Service. The copying, redistribution, or publication of any part of the Network is prohibited, except as expressly provided below.

A Member who uploads any file to the Network for inclusion in any Software Library by such act grants (and represents and warrants that he or she is authorized to grant) to the Network Publisher of the Network Service to which such file was uploaded an irrevocable, non-exclusive, royalty-free license to publish, distribute and redistribute that file in any medium, whether now known or hereafter invented, including without limitation, databases distributed via computer facilities and in storage media such as a CD-ROM. For any files designated by the uploading Member as "shareware", the Network Publisher will retain and distribute in connection with such publication, distribution or redistribution any copyright notices and any license terms included by such Members.

Each Member who places information or any other content (other than any file for inclusion in any Software Library) in the public areas of any Network Service grants the Network Publisher of the Network Service to which such content was uploaded an irrevocable, non-exclusive, royalty-free, perpetual worldwide right and license to use, review, edit, copy, publish, distribute, and translate the file, information or other content in any medium, whether now known or hereafter invented, including without limitation databases distributed via computer facilities and in local storage media such as CD-ROM. In addition, each Member uploading material to any Network Service grants to all other Members permission to use all or part of the material for non-commercial purposes (as defined below), and to make copies of the material for backup purposes. Members have no other rights to copy any material downloaded from the Network. **Subject to this grant of rights, any Member who places information or other content (including software for inclusion in any Software Library) on the Network retains any rights that Member may have in that content.** Each Network Publisher agrees that it will retain any copyright notices on any content published or distributed by that Network Publisher pursuant to this license grant.

Members may not upload to the Network any copyrighted material (including photographs, video, animation, text, software programs, graphics or sound files) without the express permission of any copyright owner or the owner's agent. Only the owner or a representative designated by the owner may upload copyrighted material to the Network. By submitting material to a public area, a Member asserts that the material is his or her own, is licensed to be uploaded and downloaded by Members, is in the public domain, or is otherwise free of copyright or other restrictions. Neither INC nor Network Providers guarantee that material uploaded to the Network has been uploaded with the permission of the copyright holder; therefore, neither INC nor any Network Provider guarantees that such material may be freely used.

Each Member may download material from the Network for his or her own non-commercial use. This non-commercial use restriction means that a Member may use in connection with the internal operations of Member's business any material which Member has downloaded from the Network, but the Member is not allowed to redistribute that material over any network (including any local area network), nor sell or offer for sale that material. Members may not post any material downloaded from the Network to any other online service (including any bulletin board services or the Internet) without the express permission of the copyright holder. Member may make: (a) one machine readable copy, (b) one backup copy, and (c) one print copy of any material downloaded from the Network. Any other copying, or any redistribution or publication

of any downloaded material must be with the express permission of the relevant Network Publisher and the owner(s) or authorized person(s), if other than any Network Publisher. Permission must be specified in the material downloaded, on the Network, or must be obtained directly from the relevant Network Publisher and the owner(s), if other than a Network Publisher. In any permitted copying, redistribution or publication of copyrighted material, any changes to or deletion of any copyright notice are prohibited.

With respect to shareware programs, only the owner or representative authorized by the owner may upload shareware programs to the Network. Members may download shareware programs for their own use, subject to the terms provided by the owner. Members may only redistribute a shareware program if the terms displayed in the shareware program allow such redistribution or with permission of the owner or authorized representative of the owner. Any obligations set forth in the shareware license are solely the responsibility of the downloading Members.

Members may upload public domain programs (including “freeware”) to the Network. Members may download public domain programs for their own use. Members assume all risks regarding the determination of whether a program is in the public domain.

Each Network Publisher reserves the right to remove from the Network immediately any material which it believes may violate any copyright or other third party rights and the Member uploading this material may have his or her Membership on the Network terminated.

End of Presentation

Table of Contents

Track List

Session List

Session Summary

Transcript Start

Presentation



Setting Up ISDN Network Access

An Internet Service Provider's Perspective



InterNex

Robert Berger
Chief Technology Officer

Helping Businesses do Business on the InternetSM
First Commercial ISDN Internet Service in the US

ISDN: Minimum Speed for Internet Access

- The Web can be a production tool for work
- Enough bandwidth to support LAN connections
- Fast call setup/tear down simulates permanent connection

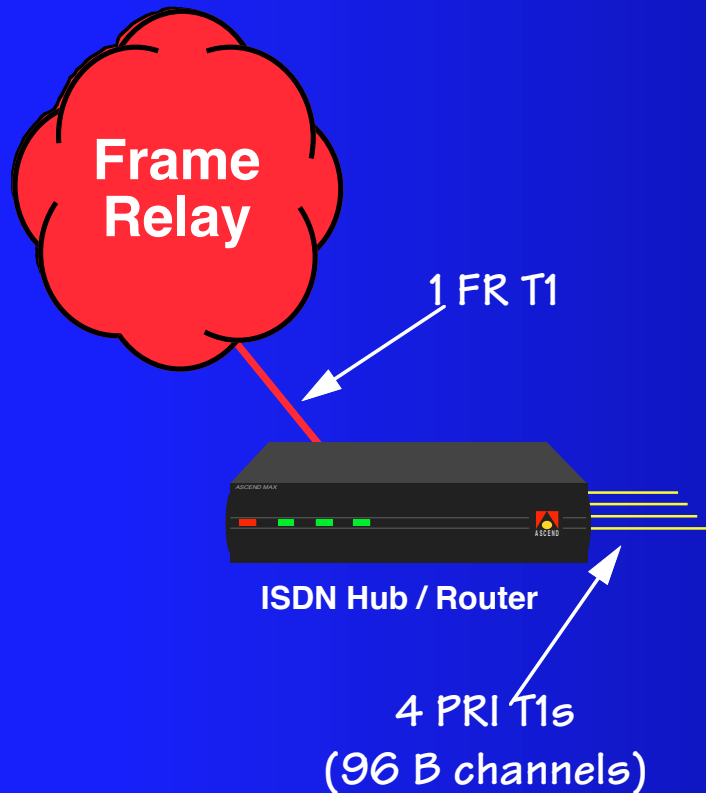
New Generation Network Needed

- Still requires local numbers for low cost dialup
- Assume 128kbps is minimum customer speed
- Total Network Bandwidth an order of magnitude higher

Match Technology to Scale

- Switched calls to Packet traffic ASAP
- PRI minimizes wire complexity
- Proper Equipment Selection

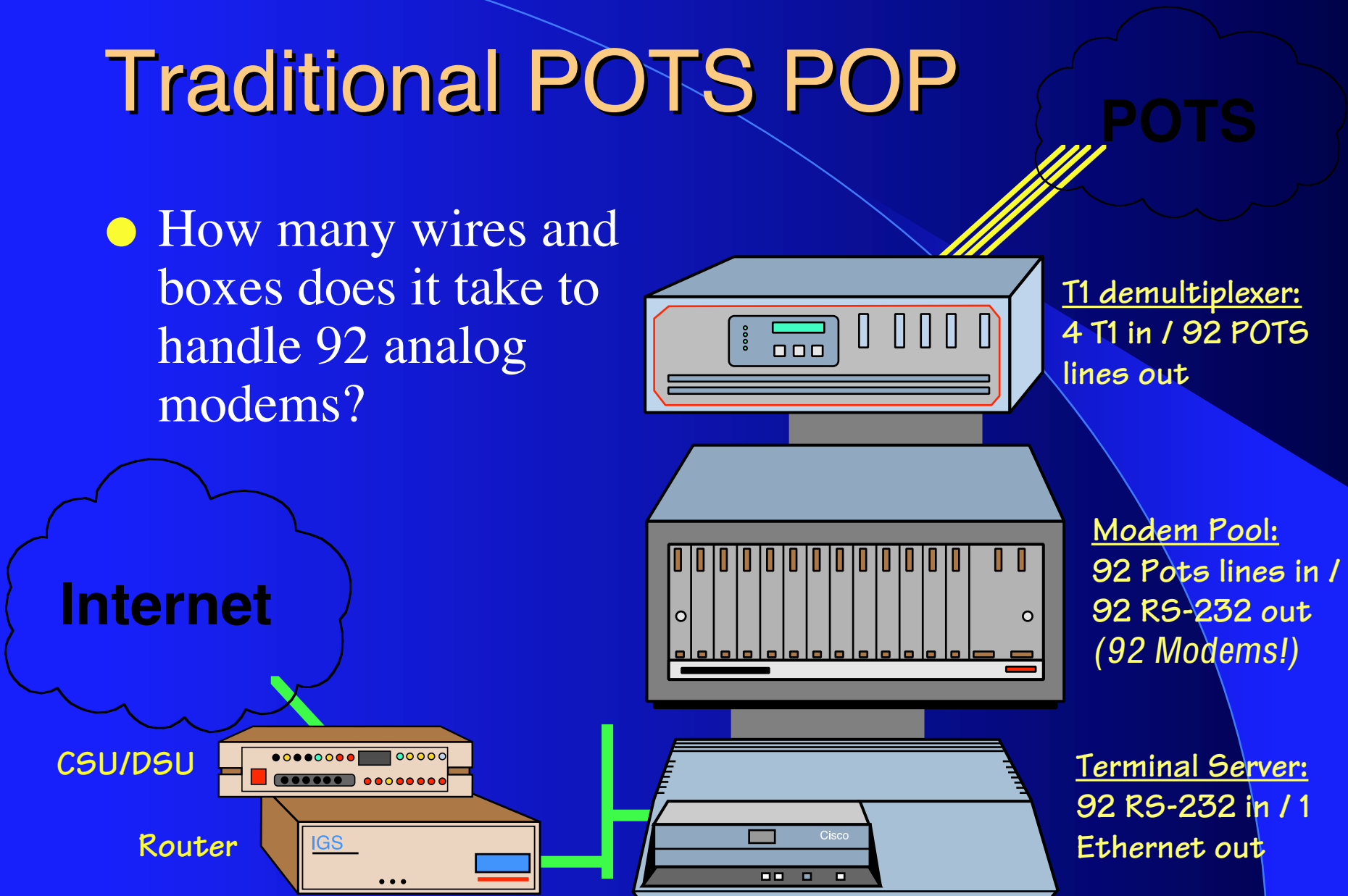
Switched Calls to Packet ASAP



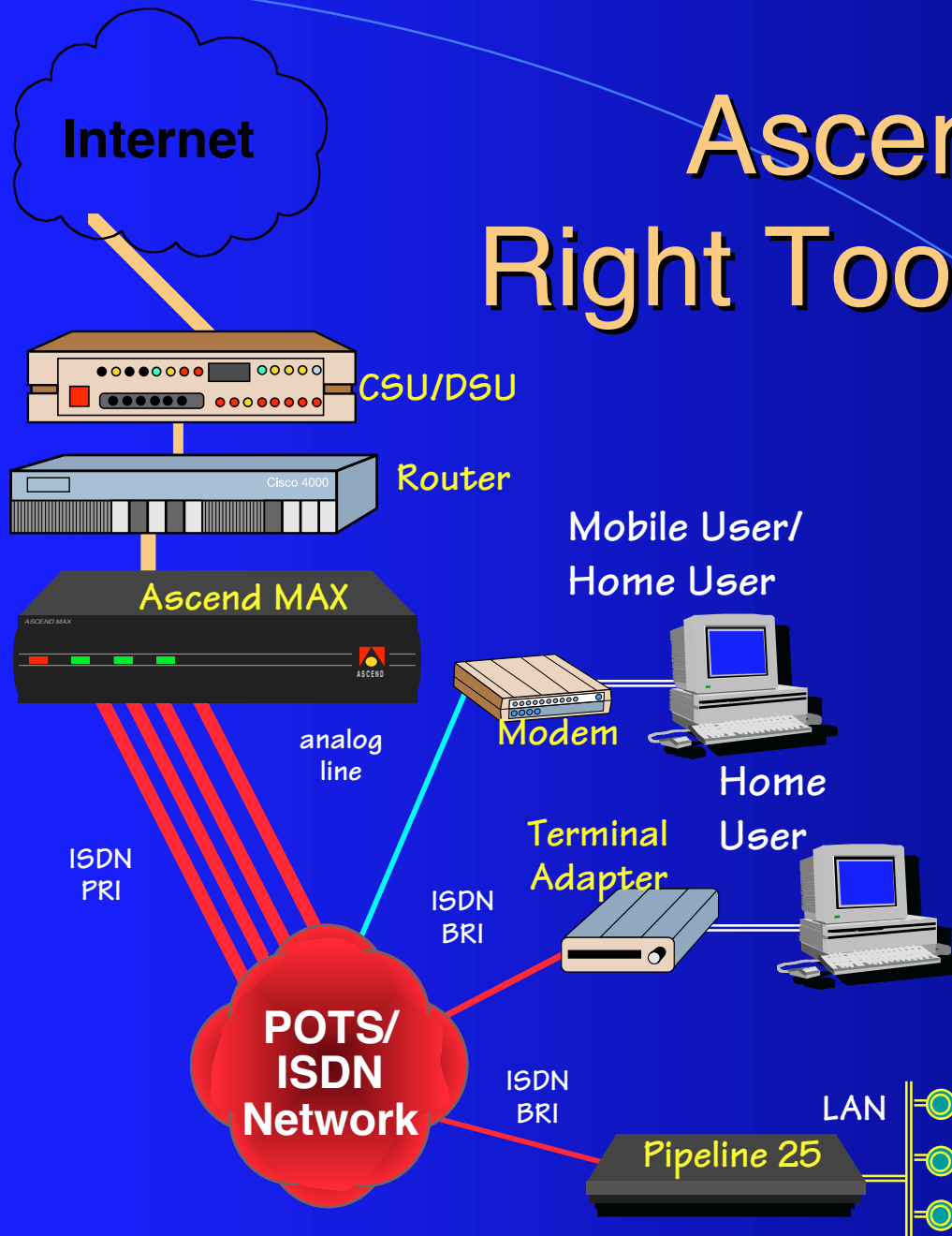
- Switched calls (POTS, ISDN) utilize resources (trunks, switches) even when no packets flow.
- Packet transport (Frame Relay, SMDS, ATM) win from statistical multiplexing.
- Conservative 4:1 ratio of switched to packet capacity

Traditional POTS POP

- How many wires and boxes does it take to handle 92 analog modems?



Ascend Max: Right Tool for the Job



- High Density
- Supports most of the key standards
- Can mix Analog and ISDN on PRI

Advantages of the Max

- Up to 4 PRIs + V.35 port
- Up to 48 simultaneous V.34 analog modem sessions
- Up to 92 simultaneous B Channel sessions
- Flexible Security

Limitations of the Max

- Limited Routing Protocol Support
 - No OSPF or Multicast
- Requires external router for sophisticated routing of backhaul link
- Does not support D Channel Transport
- Hard to debug connection problems

Security

- PAP, CHAP dialup negotiation
- Call Back, Calling Line ID
- Radius Server
- Token(Security Dynamics SecurID®, Enigma Logics SAFEWORD®)
- Packet Filtering on a per user basis

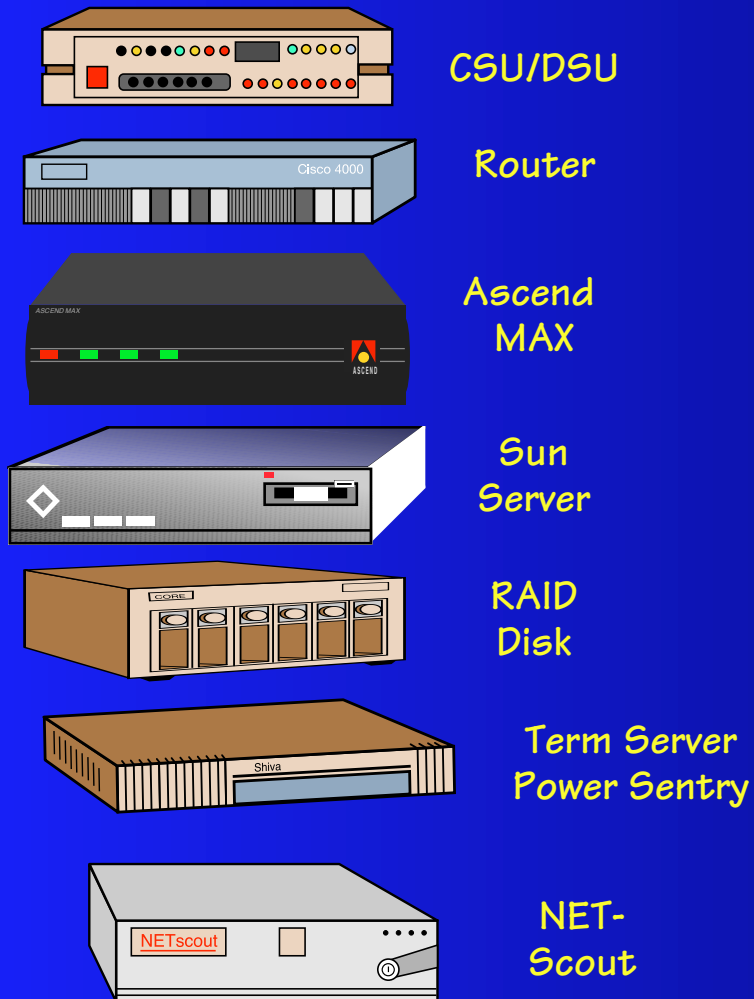
Accounting

- Radius Accounting
- Requires lots of work to extract valid billing info
- Software for billing is just now getting stable

InterNex Modular POP

- Scalable
- Pushes ALL services as close to the customer as possible
 - Email, News, DNS, Web Caching
- Rapidly Deployable
- Remotely Managed and Monitored

POP Architecture



- Router & CSU/DSU
 - Backhaul, OSPF Routing
- ISDN/Modem Router
- Local Sparc 20 Server
 - News, DNS, EMail, Caching. Diagnostics
- Terminal Server
 - Remote Console
 - Power Reset
- RMON
 - Utilization Monitoring

Location, Location, Location

- POPs have a 12 mile local calling circle
- Need lots of them to cover a region
 - 13 to cover most of the Bay Area
- Finding the right CO's with the right facilities is key
- Finding physical space for POP is not fun
- Can be expensive!

InterNex: Internet & VPN

- InterNex has the POP coverage
 - Bay Area
 - LA
 - Fresno
 - Sacramento Soon
- Local ISDN Dialup
 - Internet
 - Telecommuting
- Don't Reinvent the Wheel!



InterNex

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<http://www.internex.net>

End of Presentation

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The Wireless Future

Larry Bestor, Chairman
American Technologies, Inc.



AGENDA

- **Overview - 5 min.**
- **Current capabilities and uses - 10 min.**
- **Hardware devices - 5 min.**
- **Software applications - 5 min.**
- **Communications networks - 5 min.**
- **Future capabilities and uses - 10 min.**
- **Adjourn**



INTRODUCTION

- Wireless Access to the Internet
-
- What are the uses of this technology now?
-
- What's in store for the future?



OVERVIEW

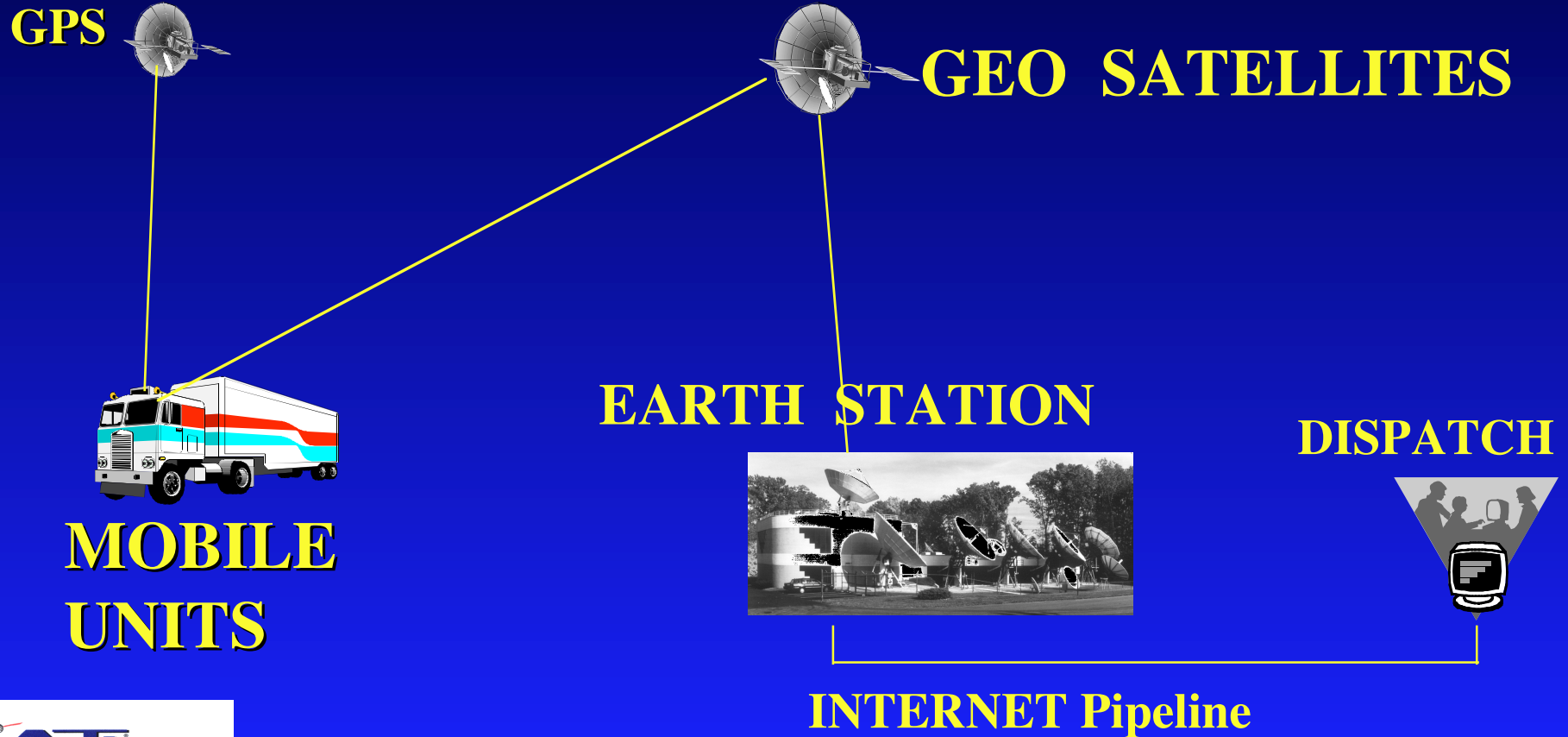
- System diagram
- GPS satellites, GEO satellites, LEO satellites, dispatch center, mobile units, radios, pagers, Internet network
- Software
- How the pieces fit together



DEFINITIONS

- GPS - Global Positioning System satellites
- GEO's - Geostationary satellites
- LEO's - Low Earth Orbit satellites
- WANS - Wide Area Networks

SYSTEM DIAGRAM





EARTH STATION





Dispatch Tracking Center

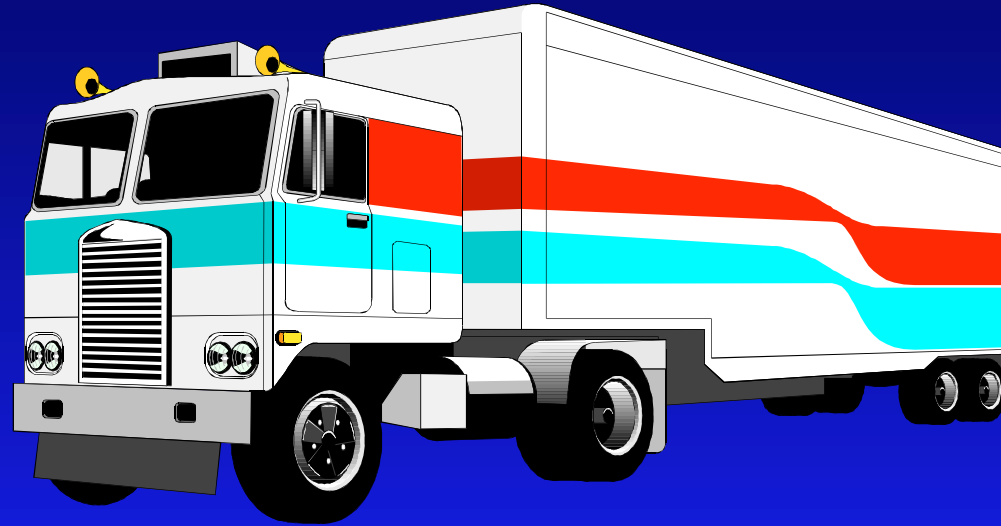


CURRENT SYSTEM USERS



POLICE

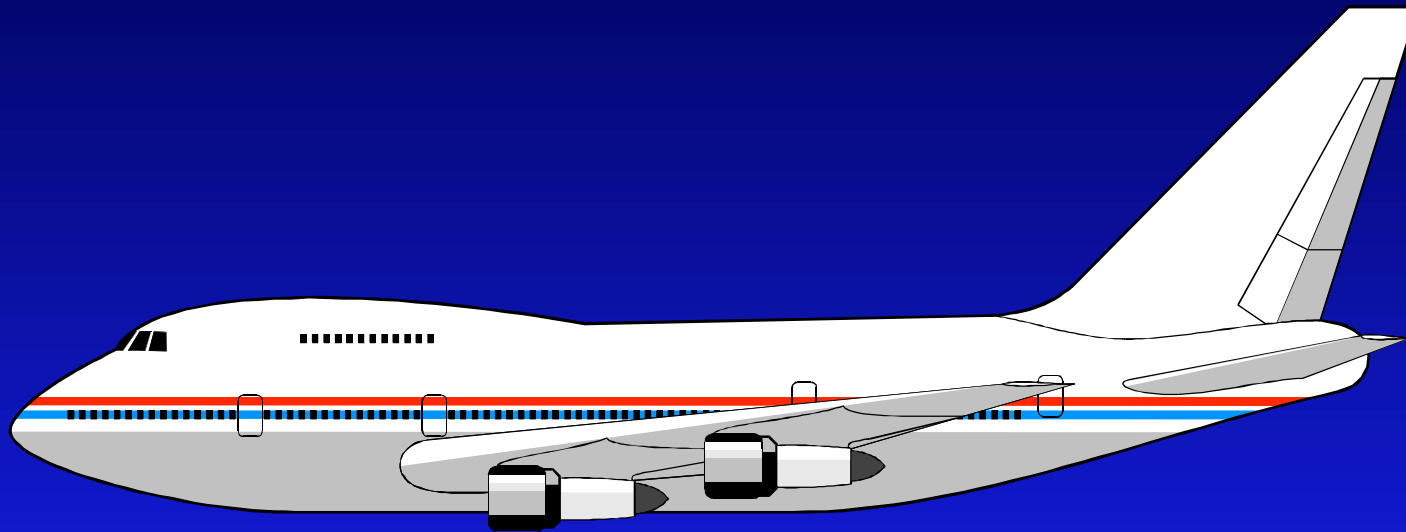
Current System Users



TRUCK FLEETS

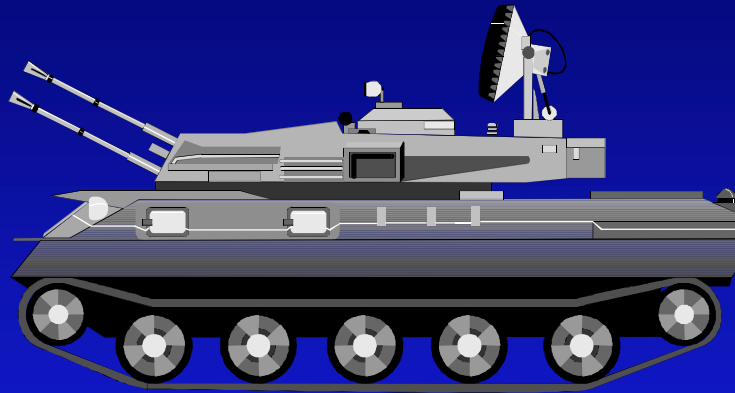


Current System Users



AIRLINES

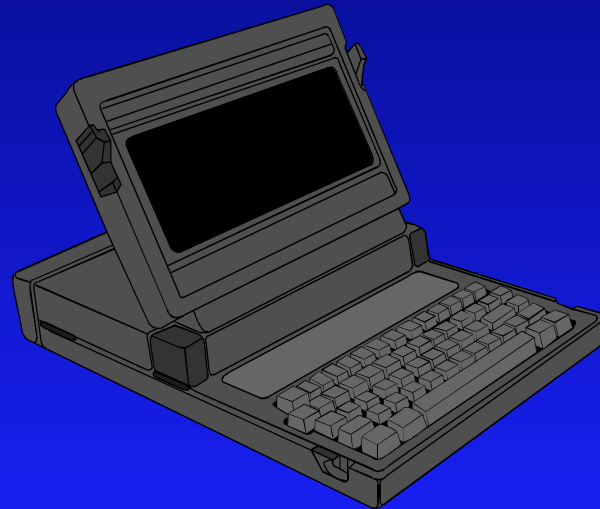
Current System Users



U.S. MILITARY

Communications Hardware

- ▶ Wireless devices: Cellular phone, pager, satellite radio transceiver, PDA's, notebook computers





Mobile Transceivers





Communications Software

- LOGITRAK
- LOGITEL software
- Paging eMAIL Software



Automatic Vehicle Location (AVL) Software

Coast to Coast Communications 24-Hours a Day

Uses Internet, Satellite, and FM Radio Networks

ACCURATE

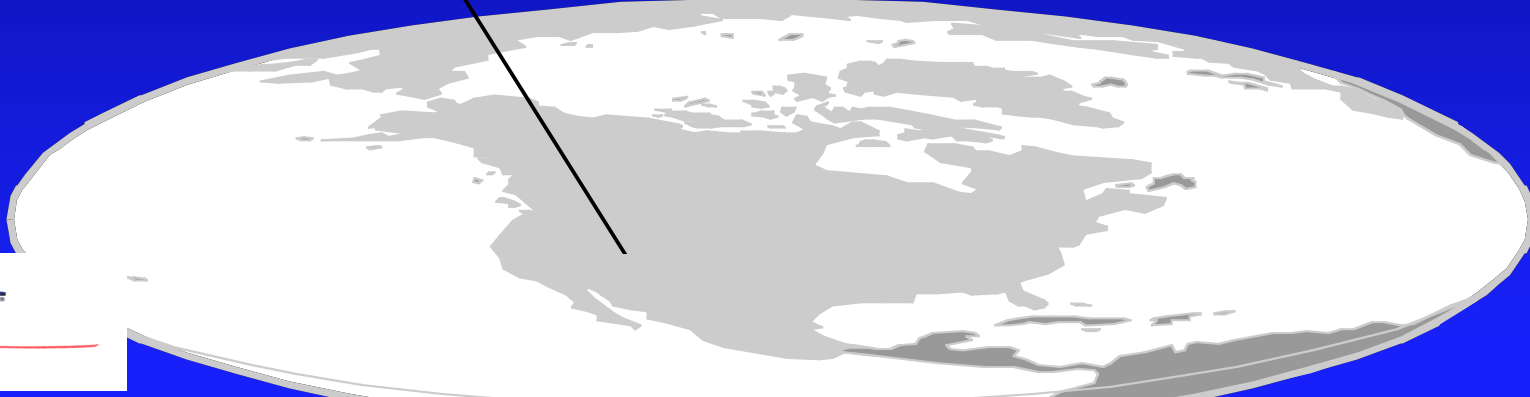
Displays Exact Position of Mobile Units using GPS

RELIABLE

Track All Types of Mobile Vehicles

COST-EFFECTIVE

Lower Long Distance Costs via Internet Use

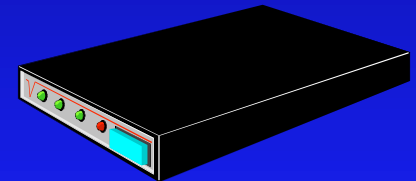
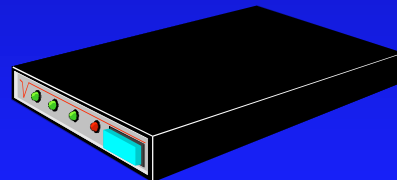
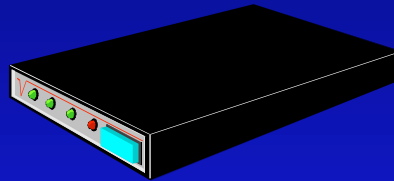
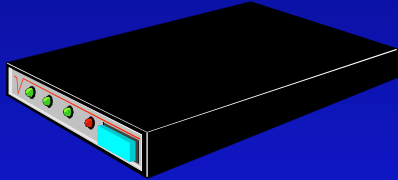
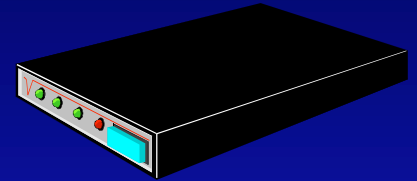




Net Access VIA WirelessWANS

Metricom's Ricochet Wireless Radio Networks

Provide High Speed access to the Net





RICOCHET SERVICE AREAS

**SILICON VALLEY
INDIANA UNIVERSITY
CAL POLYTECHNIC
UNIVERSITY OF ILLINOIS
UC BERKELEY
UC SANTA CRUZ
STANFORD
UNIVERSITY OF MIAMI
UNIVERSITY OF OREGON
OREGON STATE
SEATTLE - LATE 1995
WASHINGTON, DC - EARLY 1996**



WIRELESS BADGE NETWORKS

**University of Kent
Imperial College
London**

**Lancaster University
University of Twente, Netherlands**

Xerox PARC

DEC

Bellcore

MIT Media Lab

Cambridge University



INFRARED BADGES

**OLIVETTI
ACTIVE
BADGE**





BADGE CAPABILITIES

Locates or tracks individuals in a defined area

Transmits unique infrared signal every 10 seconds

**Buildings must be equipped with one or more
networked sensors**

Bi-directional communications



WIRELESS BADGE NETWORKS

**University of Kent
Imperial College
London**

**Lancaster University
University of Twente, Netherlands**

Xerox PARC

DEC

Bellcore

MIT Media Lab

Cambridge University

WHAT DOES THE FUTURE HOLD?





SHIPPING FLEETS



TELECOMMUTING

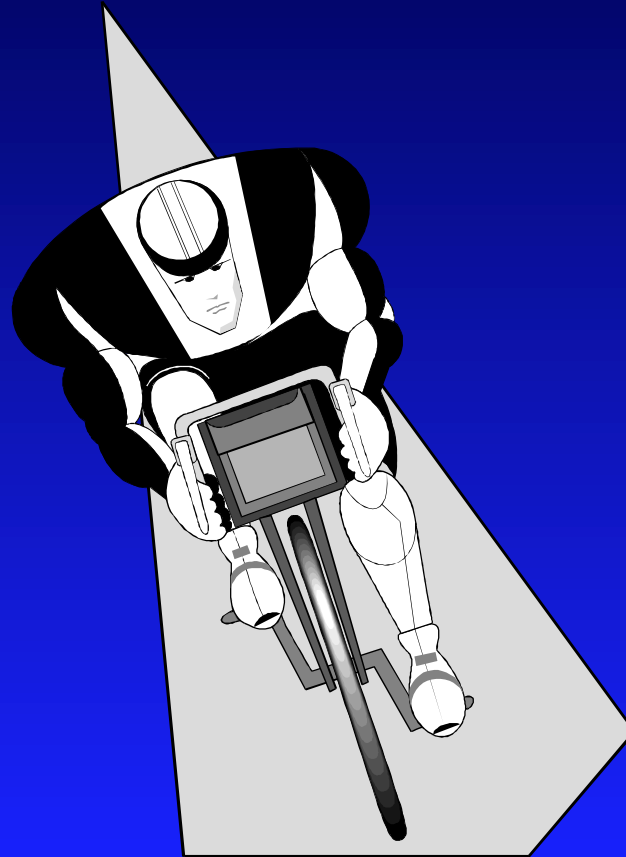




BALLOONISTS



CYCLISTS



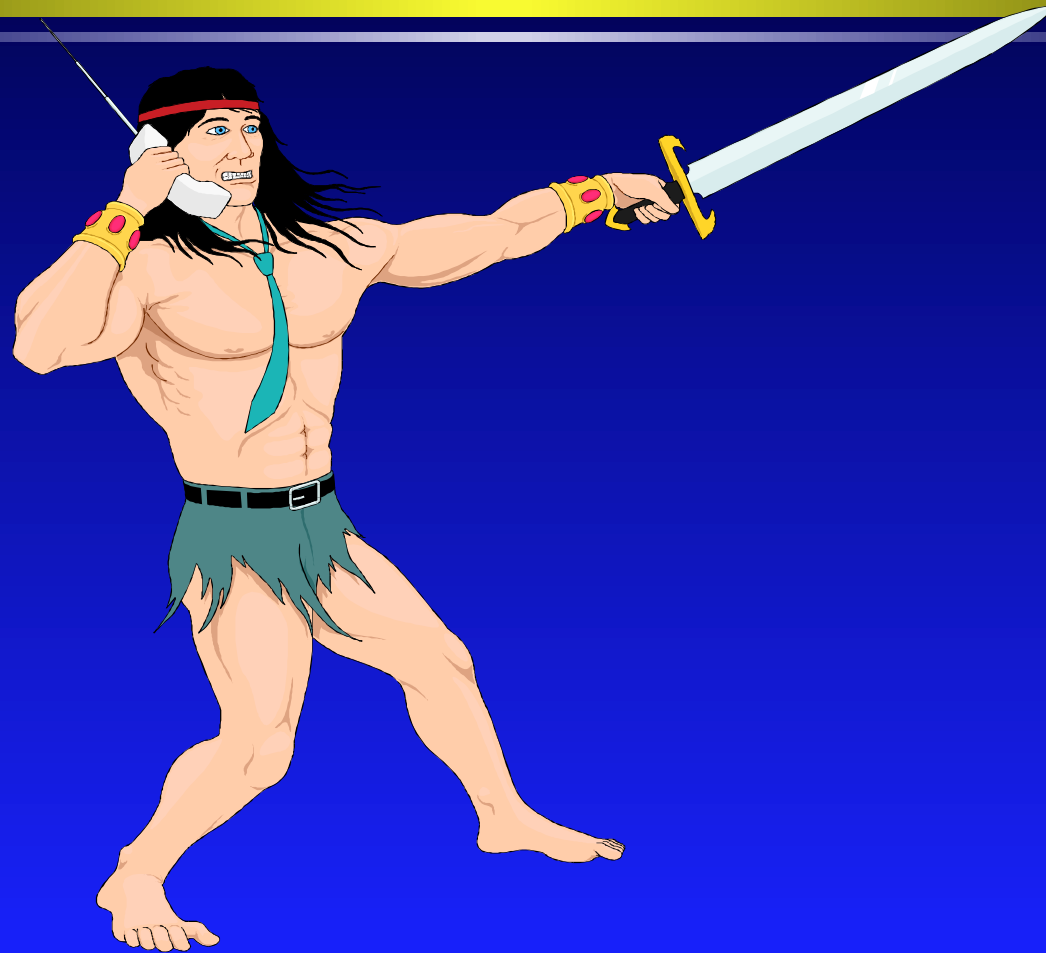
RANCHERS



WILDERNESS MAPPING



ROAD WARRIORS





EMERGENCY RESCUE



REMOTE ADVENTURERS



CRUISERS





LOCATING LOST CHILD



LOCATING LOST TEENAGERS



TRAVELING EXECUTIVES



ACCESSING REMOTE DATABASES





SUMMARY

- Future Applications:
 - Trucking industry
 - Shipping Fleets
 - Field sales people
 - Family members
 -
- Transporters
- Questions



More Info on the WEB

- <http://www.wis.com/virtual/landnet/>
- <http://www.host.cc.utexas.edu/ftp/pub/grg/gcraft/notes/gps/gps.html>
- <http://winwww.rutgers.edu:80/>
- <http://policy.net/wireless/>

End of Presentation

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C++ Techniques for Building Communication Protocol Libraries - Tutorial 3 -

Michael Baldwin
baldwin@dart.com
<http://www.dart.com>
Fall Internet World '95
October 30, 1995



About the Presenter

- ◆ Developed first Windows 2.0 TCP/IP app in 1990 using Excelan TCP/IP NIC
- ◆ Commercialized first WINSOCK TCP/IP protocol library Feb 1993 (GCP++)
- ◆ Released PowerTCP v 1.0 libraries Aug 1994 (DLLs, C++ Class Libraries, VBXs)
- ◆ TCP, TELNET, FTP, SMTP, POP3, UDP, VT220, TFTP, SNMP now shipping. C++ Class Libraries, DLLs, VBXs, OCXs.

Session Goals

- ✦ How to use C++ Class mechanisms to support communication protocol implementation
 - class specialization (e.g. TCP/TELNET)
 - encapsulation (e.g. FTP)
 - virtual functions for event notification
 - virtual functions for base class information needs



Presentation Overview

- ◆ Section 1 - Review of C++ mechanisms ... specialization, encapsulation, virtual functions
- ◆ Section 2 - Application of C++ mechanisms to Communications Software Development
- ◆ Section 3 - MSVC demonstration using PowerTCP libraries

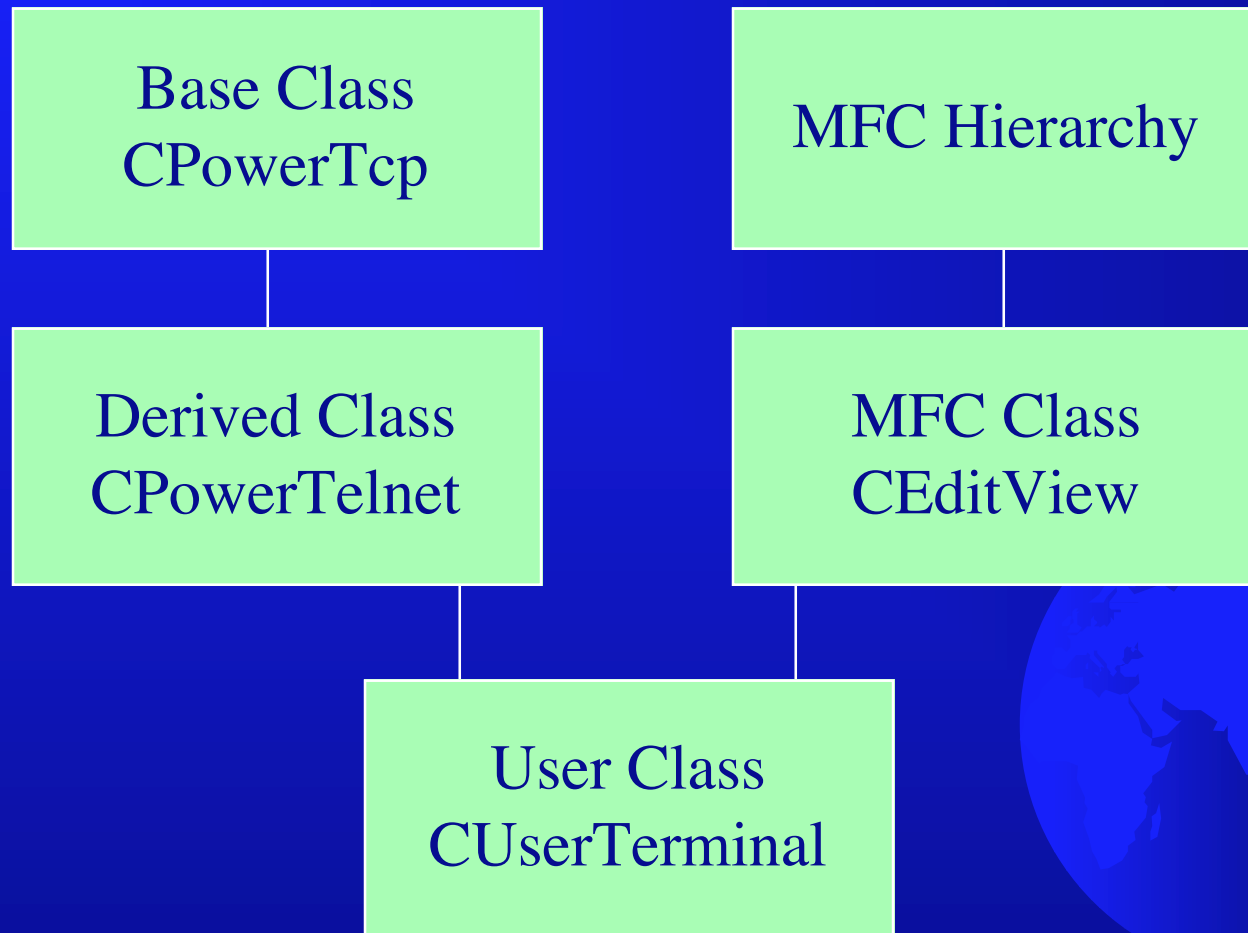


Review of C++ Mechanisms

Section 1



Class Specialization



Encapsulation

Base Class
CPowerTelnet

User Class
CUserTelnet

```
private:  
    CEditView Terminal
```



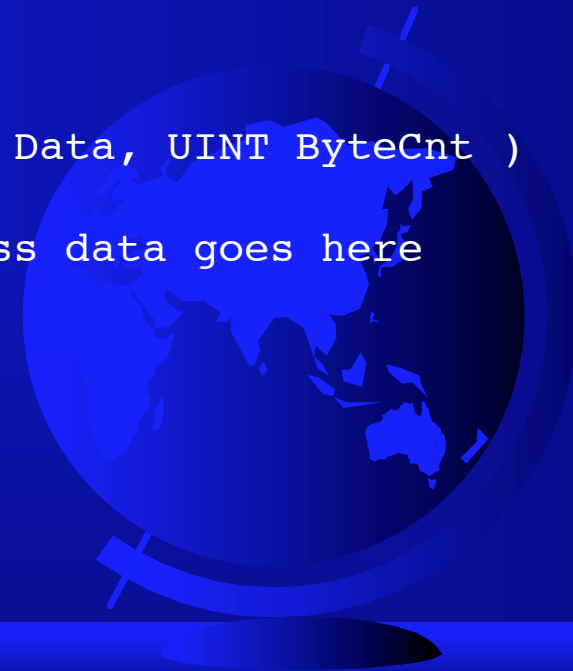
Virtual Functions for Derived Class Event Notification

Base Class
CPowerTelnet

```
virtual void RecvEvent  
    ( LPBYTE Data, UINT ByteCnt );
```

User Class
CUserTelnet

```
void RecvEvent ( LPBYTE Data, UINT ByteCnt )  
{  
    // your code to process data goes here  
}
```



Virtual Functions for Base Class Queries

Base Class
CWinsock

```
virtual PT_TYPE Protocol ( void ) = 0 ;
```

Derived Class
CPowerTelnet

```
PT_TYPE Protocol ( void )  
{  
    return PT_TELNET;  
}
```



Application of C++ Mechanisms to Communications Software Development

Section 2



Transmission Control Protocol

- ✦ connection oriented ... stream ... no record blocking ... “bursty” communications
- ✦ Reliable end-to-end communications
- ✦ Connections can be established as:
 - “active” ... a client makes active connections
 - “passive” ... a server accepts connections



Typical Active Connect

- ◆ create a socket, bind it to a port/address, set options and notification choices, launch connect request
- ◆ catch notification of successful connect
- ◆ send/recv data according to the upper layer protocol being implemented
- ◆ close connection



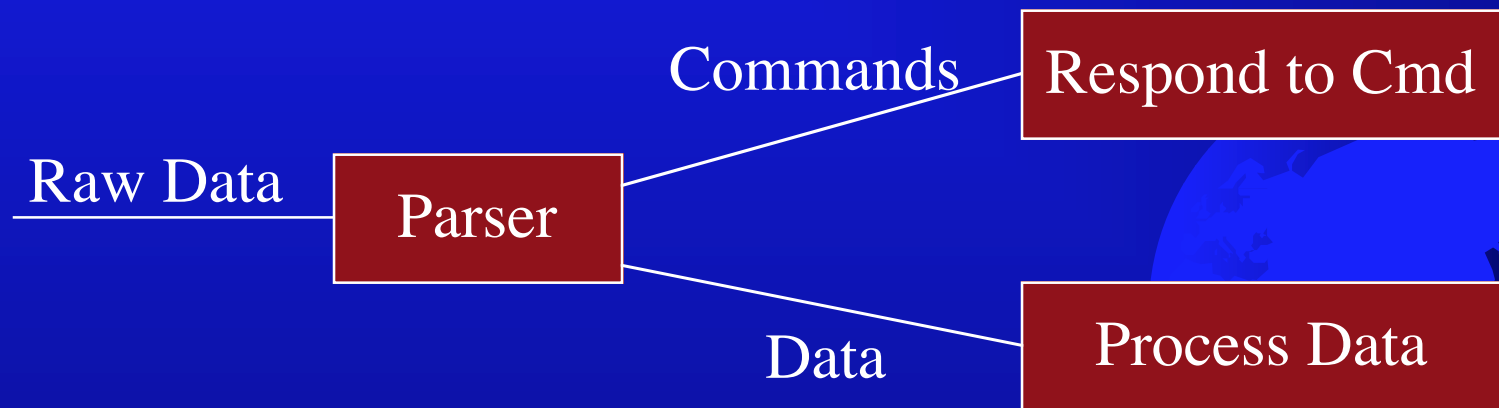
TCP Stream Class

```
class CPowerTcp
{
protected:
// notification functions from Tcp follow...
virtual void ConnectEvent (LPCSTR RemoteDotAddr, WORD RemotePort,
                           LPCSTR LocalDotAddr, WORD LocalPort, LPCSTR LocalName);
virtual void RecvEvent (LPBYTE Data, UINT ByteCnt);
virtual void SendEvent (DWORD DataTag);
virtual void ListenEvent (LPCSTR LocalDotAddr, WORD LocalPort, LPCSTR LocalName);
virtual void AcceptEvent (void);
virtual void ExceptionEvent (PT_EXCEPTION ErrorCode, LPCSTR ErrorDesc)=0;
public:
BOOL Connect (LPCSTR OemLicense, PT_FLAGS Flags, LPCSTR RemoteHost,
              WORD RemotePort, LPCSTR LocalDotAddr, WORD LocalPort);
BOOL Accept (LPCSTR OemLicense, PT_FLAGS Flags, CPowerTcp &Listener);
BOOL Send (LPVOID Data, UINT ByteCnt, BOOL Urgent, DWORD DataTag);
BOOL Recv (UINT MaxByteCnt);
BOOL Listen (LPCSTR OemLicense, PT_FLAGS Flags, LPCSTR LocalDotAddr,
             WORD LocalPort, WORD Timeout=0);
BOOL Close (BOOL NoDelay);
PT_STATE State (void);
CPowerTcp (HINSTANCE);
~CPowerTcp (void);
};
```



TELNET

- ✦ Used to “login” to a remote UNIX host
- ✦ Commands are embedded in the data stream
- ✦ Data must be parsed, searching for these sequences, which must be responded to*



* most hosts will halt communications, waiting for a response

Typical TELNET Session

- ♦ create TELNET connection (port 23)
- ♦ search for control sequences and respond to them with WILL, WONT, DO or DONT responses
- ♦ (usually) display data to user viewing ...
may implement terminal emulation
- ♦ (usually) send ascii data as user types
- ♦ close connection when complete



TELNET Class

```
class CPowerTelnet : public CPowerTcp
{
private:
    LPBYTE Search (LPBYTE ptr, BYTE ch, size_t limit);
    // Space for TELNET commands spanning receives
    BYTE CmdBuf[100];
    int CmdCnt;
    void CheckTelnetCmd(void);
    // assessor functions from PowerTcp follow...
    void RecvEvent (LPBYTE Data, UINT ByteCnt);
protected:
    // notification functions must be overridden by derived classes...
    virtual void TelnetRecvEvent (LPBYTE Data, UINT ByteCnt)=0;
    virtual void CmdEvent (BYTE Cmd, BYTE Option,
        LPBYTE SubOption, UINT SubOptionCnt);
public:
    BOOL SendCmd (BYTE Cmd, BYTE Option, LPBYTE SubOption,
        UINT SubOptionCnt, DWORD DataTag);
    CPowerTelnet (HINSTANCE);
    ~CPowerTelnet (void);
};
```



File Transfer Protocol (FTP)

- ✦ authentication support (user/password)
- ✦ most file manager features are implemented (directory listings, change directory)
- ✦ binary and ascii transfers
 - binary transfers an exact image
 - ascii uses CR/LF for every end-of-line
- ✦ benefits - ubiquitous, LCD
- ✦ drawbacks - inefficient for numerous files



Typical FTP Transfer

- ✦ create TELNET control connection
- ✦ pass user and login information (control)
- ✦ create TCP “listening” daemon
- ✦ pass address and port of daemon (control)
- ✦ pass instruction for file transfer (control)
- ✦ accept connection and transfer file data
- ✦ close data connection when complete
- ✦ close control connection when finished

FTP Class

```
class CPowerFtp
{
private:
    // references to Control, Listener, and Data are used so that FTP.HPP
    // does not have to be distributed
    CFtpControl &Control;
protected:
    // notification functions must be overridden by derived classes...
    // informs us of a successful connection and login
    virtual void ConnectEvent (LPCSTR RemoteDotAddr, WORD RemotePort,
        LPCSTR LocalDotAddr, WORD LocalPort, LPCSTR LocalName);
    // informs us of an exception
    virtual void LogEvent (LPCSTR Message)=0;
    // informs us that file or list data has been received
    virtual void RecvEvent (LPBYTE Data, UINT ByteCnt);
    // informs us that file is being spooled
    virtual void TransferEvent (FTP_COMMAND Command, DWORD BlockCnt,
        DWORD ByteCnt, LPSTR LocalFileSpec);
    // informs us that FTP has a reply
    virtual void ReplyEvent (FTP_STATUS Status, FTP_COMMAND LastCommand,
        int ReplyCode, LPCSTR ReplyStr)=0;
    // informs us that previously submitted data has been sent
    virtual void SendEvent (DWORD Tag);
    CPowerFtp (HINSTANCE);
    ~CPowerFtp (void);
};
```



MSVC Demonstrations

Section 3



End of Presentation

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Windows Sockets Specification

- Tutorial 11 -

How to Develop Internet-Aware Windows Applications

Michael Baldwin
baldwin@dart.com
<http://www.dart.com>
Fall Internet World '95
October 31, 1995



About the Presenter

- ◆ Developed first Windows 2.0 TCP/IP app in 1990 using Excelan TCP/IP NIC
- ◆ Commercialized first WINSOCK TCP/IP protocol library Feb 1993 (GCP++)
- ◆ Released PowerTCP v 1.0 libraries Aug 1994 (DLLs, C++ Class Libraries, VBXs)
- ◆ TCP, TELNET, FTP, SMTP, POP3, UDP, VT220, TFTP, SNMP now shipping. C++ Class Libraries, DLLs, VBXs, OCXs.

Session Goals

- ✦ TCP and UDP - Understanding of data communication basics
- ✦ TELNET and FTP - Understanding of how Upper-Layer Protocols are implemented
- ✦ What the WINSOCK specification is, why it is important, how to use it for TCP/UDP access
- ✦ How to access WINSOCK from VC++, non-Microsoft Compilers, Visual Basic, PowerBuilder, Delphi

Presentation Overview

- ◆ Section 1 - UDP and TCP basics. TELNET and FTP.
- ◆ Section 2 - WINSOCK history and benefits. WINSOCK 1.1 Details.
- ◆ Section 3 - Development Environments. Introduction to TCP/IP Protocol Libraries.



UDP, TCP, TELNET, FTP

Section 1



User Datagram Protocol

- ✦ connectionless...block oriented...no guaranteed delivery!
- ✦ packets are individually addressed, so a single port can address many others
- ✦ broadcast packets can be received by *all* hosts on local network physical segment
- ✦ you receive all packets addressed to the port you “bind” to



Typical UDP Session

- ✦ create a socket, bind it to a port/address, set options and notification choices
- ✦ send/recv data according to the upper layer protocol being implemented
- ✦ close socket



Transmission Control Protocol

- ✦ connection oriented ... stream ... no record blocking ... “bursty” communications
- ✦ Reliable end-to-end communications
- ✦ Connections can be established as:
 - “active” ... a client makes active connections
 - “passive” ... a server accepts connections



Typical Active Connect

- ◆ create a socket, bind it to a port/address, set options and notification choices, launch connect request
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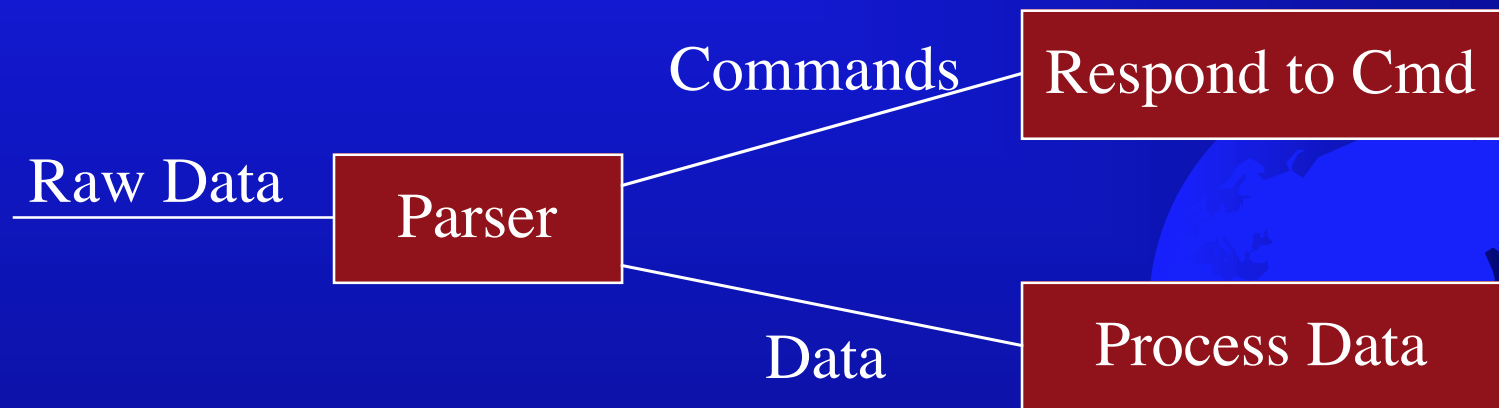
Typical Passive Connect

- ♦ create a socket, bind it to a port/address, set options and notification choices, launch listen request
- ♦ catch notification of successful connect
- ♦ accept the new connection
- ♦ set up dynamic structures to handle support for multiple accepted connections
- ♦ close connection



TELNET

- ✦ Used to “login” to a remote UNIX host
- ✦ Commands are embedded in the data stream
- ✦ Data must be parsed, searching for these sequences, which must be responded to*



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- ♦ pass address and port of daemon (control)
- ♦ pass instruction for file transfer (control)
- ♦ accept connection and transfer file data
- ♦ close data connection when complete
- ♦ close control connection when finished

Windows Sockets 1.1

Section 2



A Little History

- ✦ Early DOS TCP/IP vendors for PC (80's): FTP Software and Excelan (EXOS products). Proprietary libraries.
- ✦ First TCP/IP vendor with a DLL: NetManage (1991). Proprietary libraries.
- ✦ Developers demand an API standard for DLL access...Windows Sockets is born in 1992.
- ✦ New players take the lead, vendors with market share drag their feet

Why is WINSOCK Important?

- ◆ Apps run on any TCP/IP transport supporting WINSOCK (NetManage, Distinct, Microsoft, OS2, Wollongong, FTP, Beame & Whiteside, DEC, etc.), **increasing your potential market**
- ◆ Market success encouraged MS to make it part of WFW, Windows NT, and Windows 95, **increasing your potential market**
- ◆ Version 2 will support addition transports, **again increasing your potential market**

Comm Software 101

- ✦ Synchronous Blocking functions: capture thread and return when function successful (typical in UNIX, but not DOS/Windows)
- ✦ Synchronous NonBlocking functions: capture thread and return quickly whether successful or not (typical polling in DOS)
- ✦ Asynchronous NonBlocking functions: event triggers call to function (typical event-driven system like Windows)

WINSOCK Communications

- ✦ can call blocking functions, but only one may be active at any time (OS limitation)
- ✦ can call non-blocking functions on a timer, but polling is inefficient
- ✦ recommended: let WINSOCK trigger successful connect, when more data can be sent, when data is present to receive - efficient and never interferes with other tasks



Typical Active Connect

- ◆ create a socket, bind it to a port/address, set options and notification choices, launch connect request
- ◆ catch notification of successful connect
- ◆ send/recv data according to the upper layer protocol being implemented
- ◆ close connection



socket ()

- ◆ specify SOCK_STREAM for a TCP socket
- ◆ specify SOCK_DGRAM for a UDP socket



bind ()

- ✦ when a socket is created, it is not yet associated with a local port or address
- ✦ bind() assigns an address and port to the socket prior to establishing TCP connections or use with UDP



WSAAsyncSelect ()

- ✦ preferred mechanism for notification of connect, close, recv data, readiness for writing, recv urgent data, incoming connection to accept
- ✦ recv data, recv urgent data, and incoming connections are “level triggered”



ioctlsocket ()

- ✦ used to enable/disable non-blocking operations
- ✦ used to determine the amount of data that can be read
- ✦ checks for urgent data to be read



connect ()

- ✦ create a connection to the specified host
- ✦ a blocking socket can capture the thread for seconds
- ✦ use select() to determine the completion of the connection request on a non-blocking socket -or-
- ✦ use WSAAsyncSelect() to have an event generated to signal completion



recv ()

- ✦ normally used to receive data on a TCP connection
- ✦ calling recv() copies received data into the buffer specified
- ✦ if a blocking socket, and no data is available, will capture thread until data is available
- ✦ a result of 0 bytes indicates a closed connection



send ()

- ✦ normally used to send data over TCP connections
- ✦ application must be prepared if all data is not buffered into the kernel buffers



closesocket ()

- ✦ closing a connected TCP socket involves handshaking with the remote host
- ✦ socket parameters are used to specify a hard close, a blocking graceful close, or a non-blocking graceful close (the system is trusted to close the connection even if your application is unloaded)



Typical Passive Connect

- ♦ create a socket, bind it to a port/address, set options and notification choices, launch listen request
- ♦ catch notification of successful connect
- ♦ accept the new connection
- ♦ set up structures to handle support for multiple accepted connections
- ♦ close connection



listen ()

- ✦ to make a passive connection, first create a socket then use listen() to allow the kernel to listen for incoming connections
- ✦ use accept() to create each connection



accept ()

- ✦ extracts the first connection on the queue of pending connections on the listening socket and returns a handle to the new socket
- ✦ new sockets are “spawned” as clients connect to the host
- ✦ an object-oriented development environment helps make this manageable



Typical UDP Session

- ✦ create a socket, bind it to a port/address, set options and notification choices
- ✦ send/recv data according to the upper layer protocol being implemented
- ✦ close socket



sendto ()

- ✦ normally used to send data over UDP sockets
- ✦ application must be prepared if all data is not buffered into the kernel buffers
- ✦ remote address and port must be specified, and may be used to send to multiple hosts
- ✦ broadcast address can be used to send to all hosts on the physical segment

recvfrom ()

- ✦ normally used to receive data on a UDP socket
- ✦ calling recv() copies received data into the buffer specified
- ✦ if a blocking socket, and no data is available, will capture thread until data is available
- ✦ also returns source address and port



select ()

- ◆ blocking notification technique
- ◆ recommend WSAAsyncSelect() be used instead



misc

- ✦ getpeername ()
- ✦ getsockname ()
- ✦ getsockopt ()
- ✦ setsockopt ()
- ✦ shutdown ()
- ✦ htonl ()
- ✦ htons ()
- ✦ ntohl ()
- ✦ ntohs ()
- ✦ inet_addr ()
- ✦ inet_ntoa ()



Database Routines

- ◆ getprotobyname()
- ◆ getprotobynumber()
- ◆ getservbyname()
- ◆ getservbyport()
- ◆ gethostbyaddr()
- ◆ gethostbyname()
- ◆ gethostname()
- ◆ WSAAsyncGetProtoByName()
- ◆ WSAAsyncGetProtoByNumber()
- ◆ WSAAsyncGetServByName()
- ◆ WSAAsyncGetServByPort()
- ◆ WSAAsyncGetHostByAddr()
- ◆ WSAAsyncGetHostByName()



Misc WSA Functions

- ✦ WSAStartup()
- ✦ WSACleanup()
- ✦ WSAGetLastError()
- ✦ WSASetLastError()
- ✦ WSACancelAsyncRequest()
- ✦ WSAIsBlocking()
- ✦ WSASetBlockingHook()
- ✦ WSAUnhookBlockingHook()
- ✦ WSACancelBlockingCall()



Development Environments

Section 3



Software Layers Support Productivity Tools

Standard OSI Model

Application Layer
Presentation Layer
Session Layer
Transport Layer
Network Layer
Data Link Layer
Physical Layer

TCP/IP Mapping

Upper-layer protocol: TELNET, FTP...
TCP and UDP
IP Protocol
Data Link Layer
Physical Layer

Using PowerTCP libraries

Emulator application	FTP application	Any other TCP/IP app
PowerTCP libraries: TCP, TELNET...		
TCP and UDP		
IP Protocol		
Data Link Layer		
Physical Layer		

Standard C
interface, C++
class, or VBX
interface

WINSOCK
interface

WINSOCK Interface

- ♦ Any C compiler not difficult
- ♦ MFC supplies CSocket Class Library
- ♦ Visual Basic - difficult to use asynchronous notification, but polling can work
- ♦ Delphi - difficult to establish “glue”, but can work with effort
- ♦ PowerBuilder - asynchronous notification impossible, but polling can work

Libraries that use WINSOCK

- ◆ High-level DLLs can simplify functionality to make interfacing easier
- ◆ Visual Basic Components can integrate WINSOCK into VB, PowerBuilder
- ◆ Delphi VCL Components can integrate WINSOCK into VB
- ◆ OLE Components can integrate WINSOCK into any environment with OLE Containers

Shareware Components

- ◆ dsSocket (Dolphin Systems), IPPORT (DevSoft) and other shareware products bridge the gap between WINSOCK and VBX environments
- ◆ low-cost or no-cost
- ◆ little or no support
- ◆ found on the `net, compuserve, etc.
- ◆ differing levels of quality



Commercial Components

- ◆ Technical support available
- ◆ Usually offer more value-add with Upper Layer Protocols (TELNET, FTP, etc)
- ◆ SDKs and Toolkits include comprehensive examples
- ◆ Toolkits \$298 - \$698 and charge user-based run-time licensing fees
- ◆ Some offer fixed-fee licensing



Commercial Library Vendors

- ◆ NetManage - tool use requires licensing of their run-time kernel
- ◆ Distinct - run-time extensions (licenses)
- ◆ Dart Communications - 3 options
 - run-time licenses
 - distribution license for unlimited distribution
 - OEM Partner Subscription includes annual maintenance and support



Final Thoughts...

- ♦ Internet Software ... great opportunities exist
- ♦ WINSOCK interface ... requires a great deal of testing over multiple stacks before you are “commercial grade”
- ♦ Visual Basic and Delphi ... great RAD environments!



Additional information...

- ♦ UNIX Network Programming, W. Richard Stevens, Prentice Hall
- ♦ sunsite.unc.edu
 - pub/micros/pc-stuff/ms-windows/winsock
- ♦ Douglas Comer has a series of TCP/IP protocol books



End of Presentation

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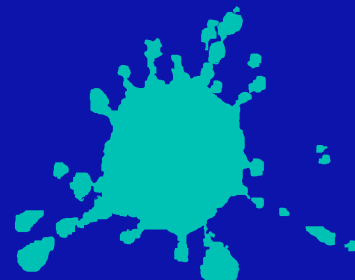
Presentation






Steve Bowbrick

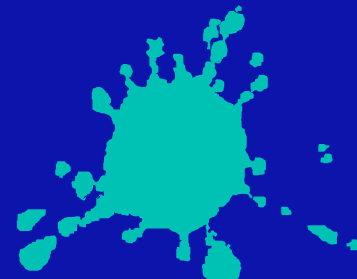
- ◆ Managing Director, Webmedia
- ◆ steve@webmedia.com
- ◆ +44 171 224 7244





Europe—big place!

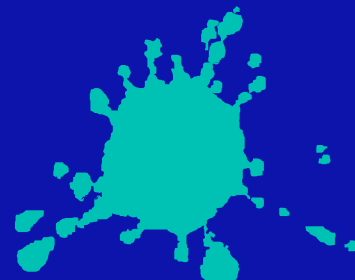
- ◆ 300 million people
- ◆ 15 countries in the EU
- ◆ Over thirty languages
- ◆ Distinct national identities
- ◆ Ancient culture





Huge technology gradient

- ◆ EU working to even out North/South differences
- ◆ Different regulatory regimes complicate things
- ◆ Uneven national wealth
- ◆ Lower per capita income



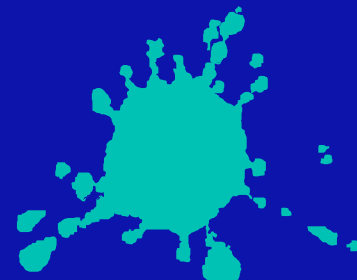
The regulatory mix

- ◆ UK leads in telecoms/media liberalisation
- ◆ US-style telco de-regulation
- ◆ Long-distance/local split
- ◆ Cable enters UK telephony
- ◆ Local loop now competitive
- ◆ Satellite TV has a large presence
- ◆ Cable passes only 20% of homes



Raw numbers

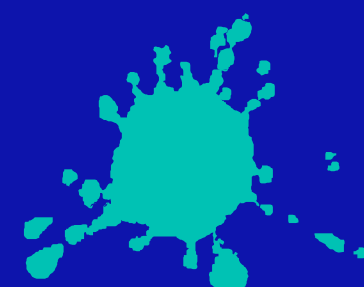
- ◆ 400,000 hosts in the UK
- ◆ Highest growth in Europe
- ◆ 1 million connected in the UK
- ◆ (4th Arpanet host in London)





The leapfrog effect

- ◆ Tiny legacy Internet user base
- ◆ Very few personal shell accounts
- ◆ Consumer market leaps straight to SLIP/PPP
- ◆ Huge boost for the web



The lesson from cable

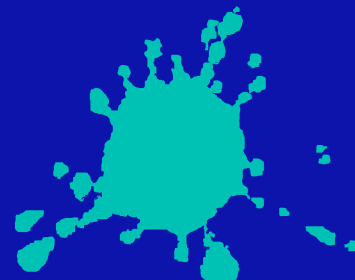
- ◆ A laboratory for US firms
- ◆ Telephony delivers revenue fast
- ◆ New high-margin products on the horizon



The on-line landscape 1

◆ The web

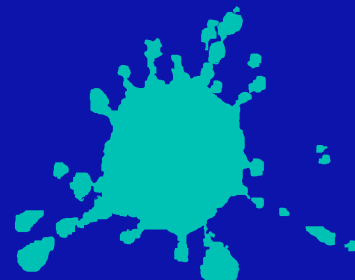
- ◆ 80 access providers in the UK
- ◆ Local dial everywhere
- ◆ Mom & Pop to BT
- ◆ v34 everywhere





The Americans are coming!

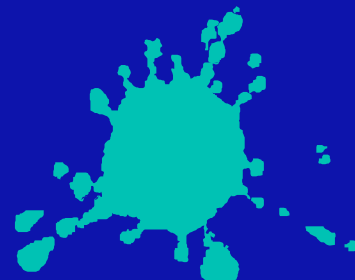
- ◆ PSI buys EUNet GB
- ◆ UUNet bids for Pipex/Unipalm
 - ◆ (who gets their bandwidth?)
- ◆ Bandwidth partnerships across Europe
- ◆ Still room for more!





European creative resources

- ◆ Design
- ◆ Advertising
- ◆ Art/literature



The on-line landscape 2

- ◆ Commercial services
 - ◆ last year...
 - ◆ CompuServe

The online landscape 3

◆ Commercial services

◆ next year:

- ◆ CompuServe
- ◆ AOL/Bertelsmann
- ◆ Delphi
- ◆ MSN
- ◆ BT
- ◆ Many local variants

Europe Online

UK Online (Olivetti)

Prodigy/IBM

(eWorld)

Virgin



Who's developing content?

- ◆ Media owners

- ◆ The Telegraph

The BBC

- ◆ Corporates

- ◆ Lloyds Bank

Lufthansa

- ◆ Ad agencies

- ◆ Cordiant

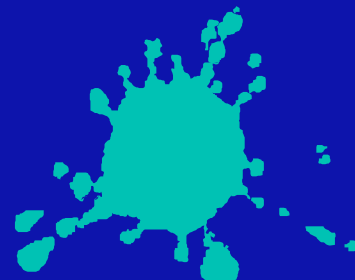
Ogilvie & Mather





What's their model?

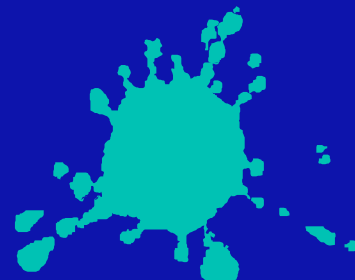
- ◆ Media owners
 - ◆ Like TV without rules
- ◆ Corporates
 - ◆ Billboards
- ◆ Ad agencies
 - ◆ Mass medium





Cultural differences

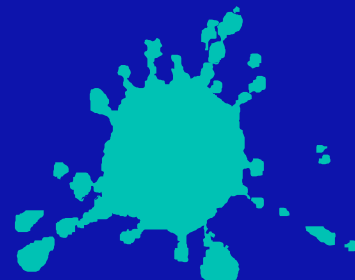
- ◆ Public service deeply embedded
- ◆ No concept of 'paid-for programming'
- ◆ Weird funding models
- ◆ Cynical audience





What do we want from you?

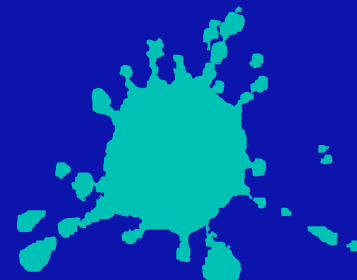
- ◆ Your bandwidth
- ◆ Your technical know-how
- ◆ Your entrepreneurial drive
- ◆ Your ATTITUDE





What do you get?

- ◆ Creativity
- ◆ Audience
- ◆ Compelling content
- ◆ 600 million eyeballs



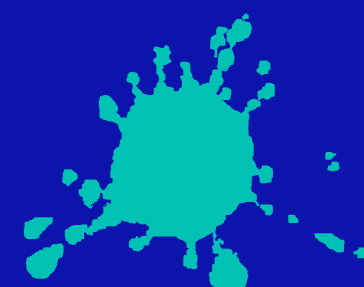
A bridge-head in a growing market

- ◆ Spreading East
- ◆ 20 countries by 2000?
- ◆ The most diverse market in the world
- ◆ Internal trade barriers effectively down
- ◆ Investment-friendly environment



How to get involved

- ◆ Strategic partnership
- ◆ License your content product for Europe
- ◆ Source European content in Europe
- ◆ Get yourself a distributor

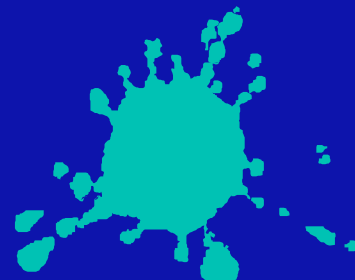




UK Internet trade body

◆ The IDA

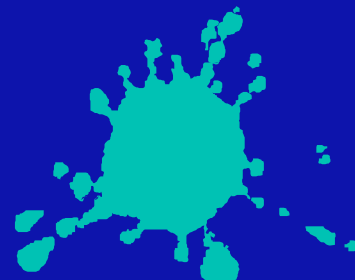
- ◆ Media owners
- ◆ Production houses/content developers
- ◆ Ad agencies





Steve Bowbrick

- ◆ Managing Director, Webmedia
- ◆ steve@webmedia.com
- ◆ +44 171 224 7244



End of Presentation

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Internet World

E3

ISDN Equipment & Interoperability

1:30 pm - 2:30 pm
October 30, 1995

RICHARD BRENNAN

TECHNOLOGY MANAGER

AT&T Network Systems

San Ramon, CA

email: rbrennan@attmail.com

<http://www.image2000.com>



Agenda

- **ISDN Overview**
- **ISDN Configurations**
- **Communication Protocols**
- **Equipment Examples**

The New Telephone Equation:

One Line \neq One Pair \neq One Phone \neq One Number



ISDN...

What is it ?

Your **Computer** is Digital...

Your **Documents** are Digital...

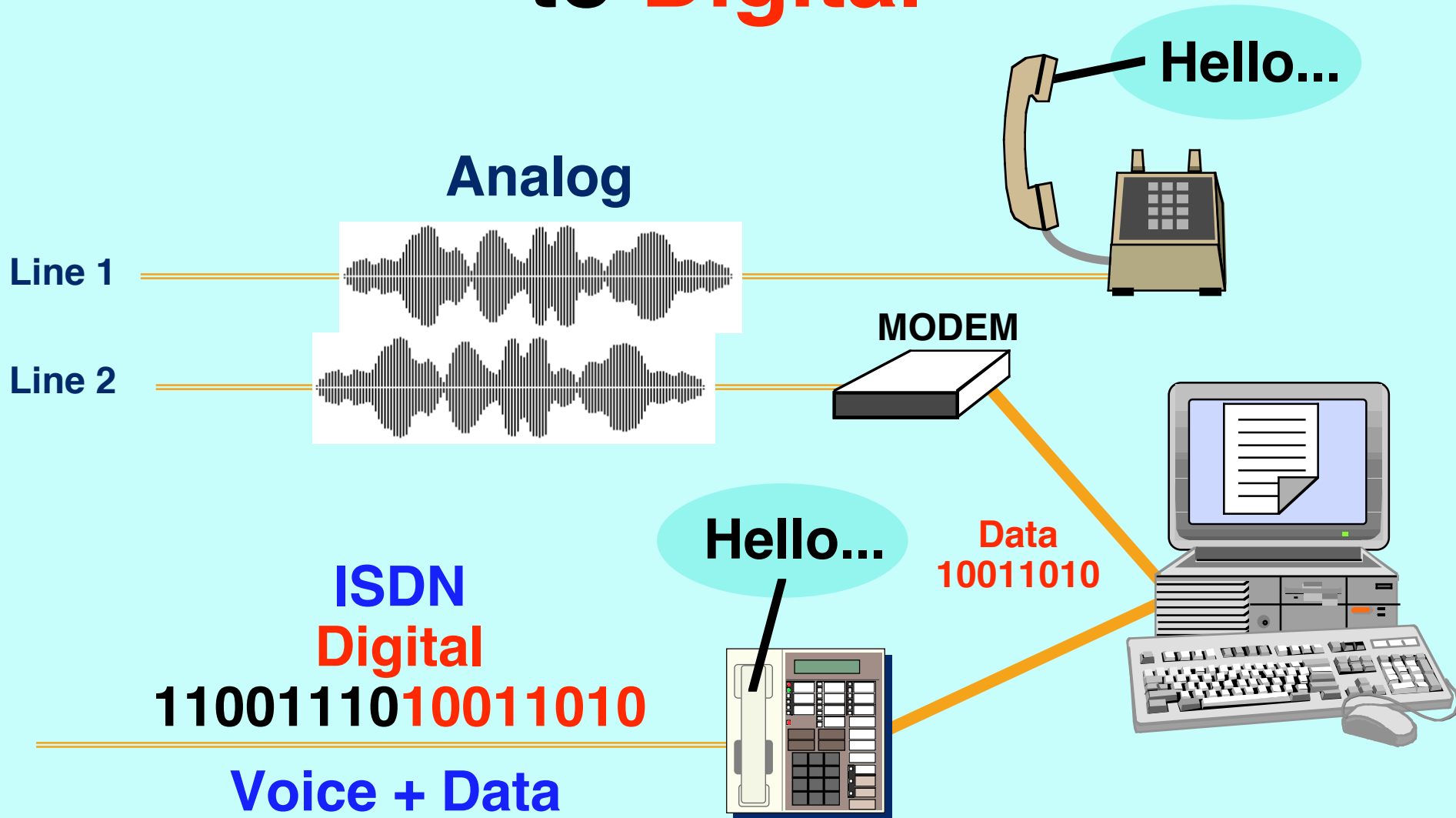
Your **Images** are Digital...

Your **LANs** are Digital...

Your **Telephone** Line is ~~Analog.~~

Digital

The Change from Analog to Digital

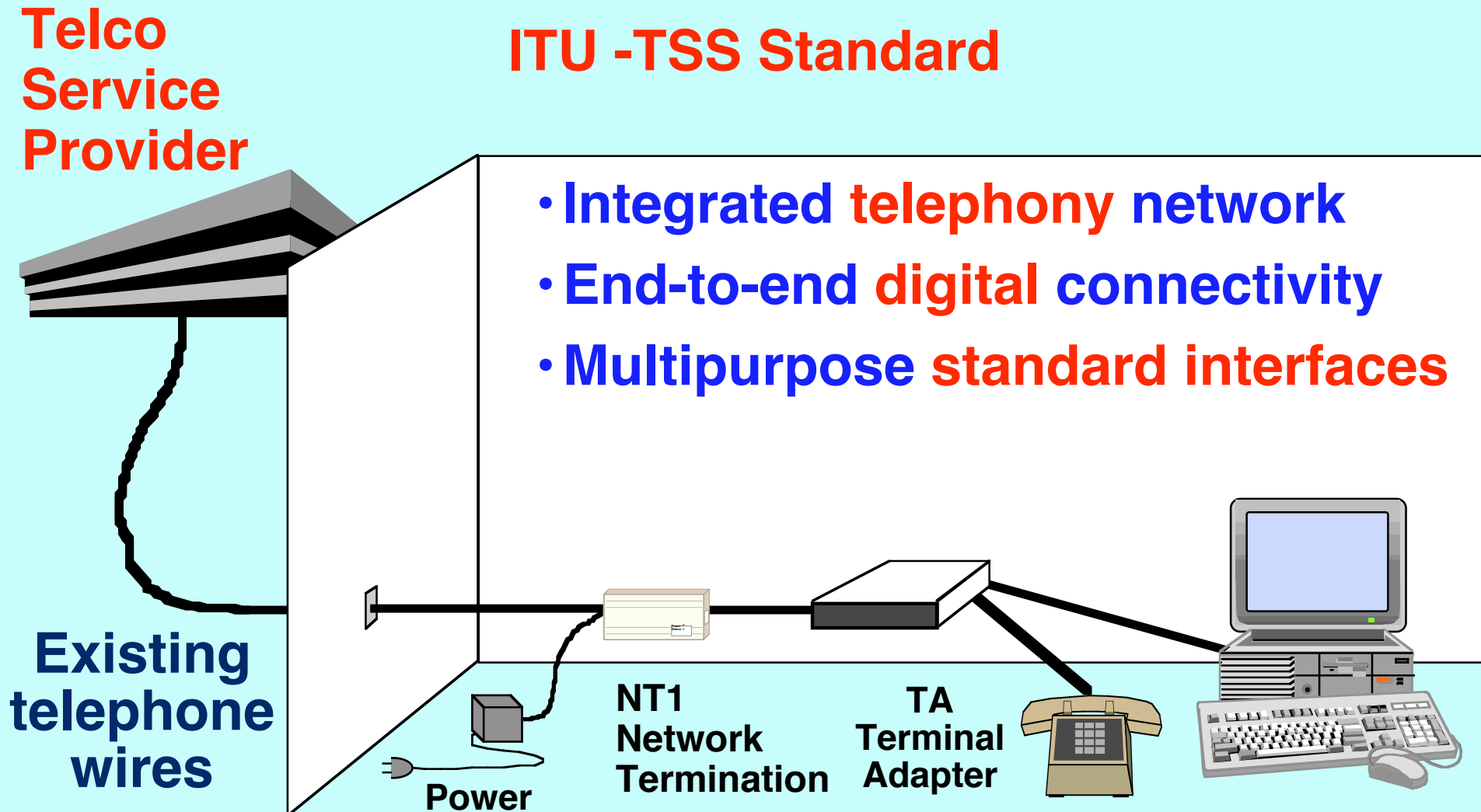


Integrated Services Digital Network

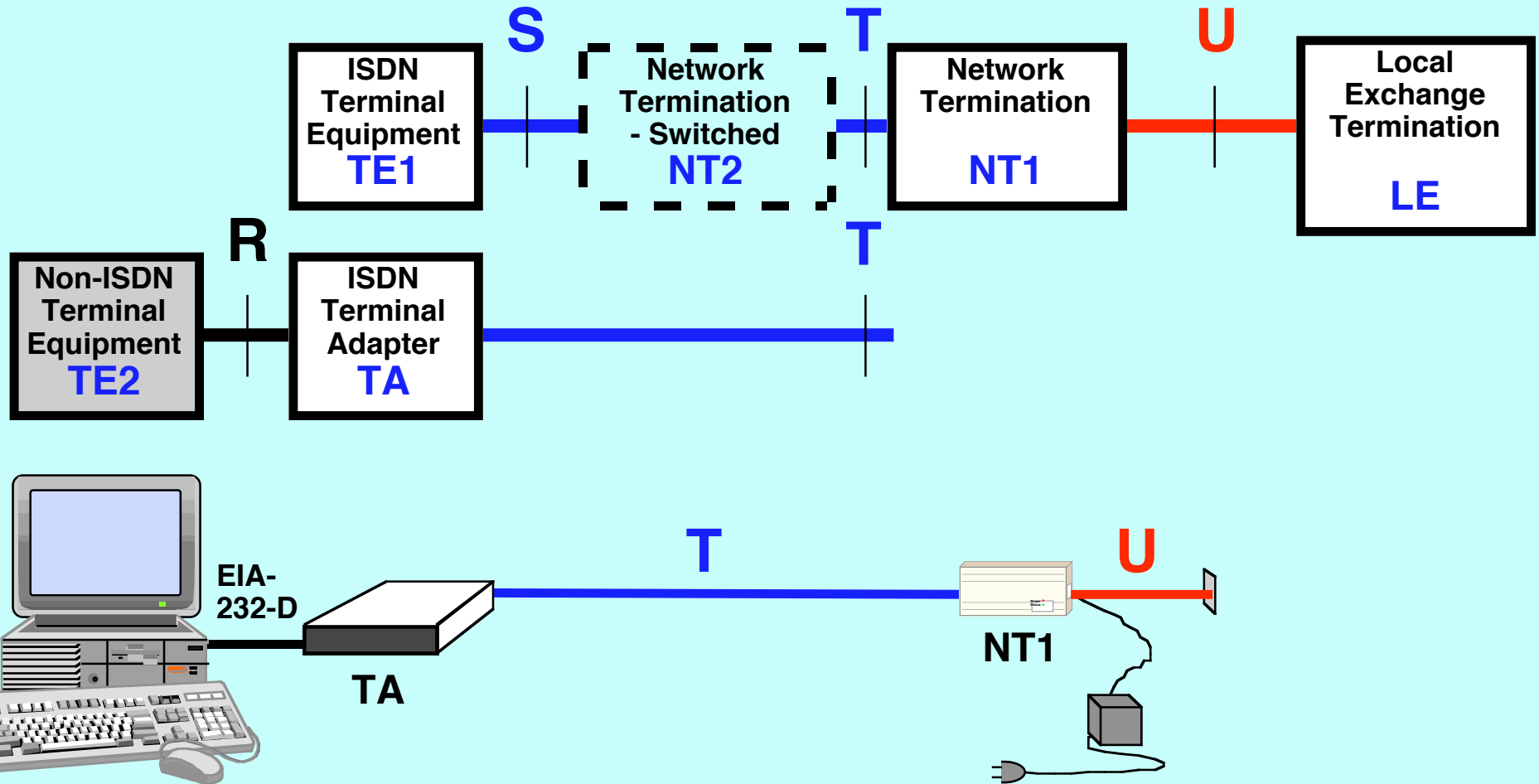
ISDN Definition:

ITU -TSS Standard

- Integrated **telephony** network
- End-to-end **digital** connectivity
- Multipurpose **standard** interfaces

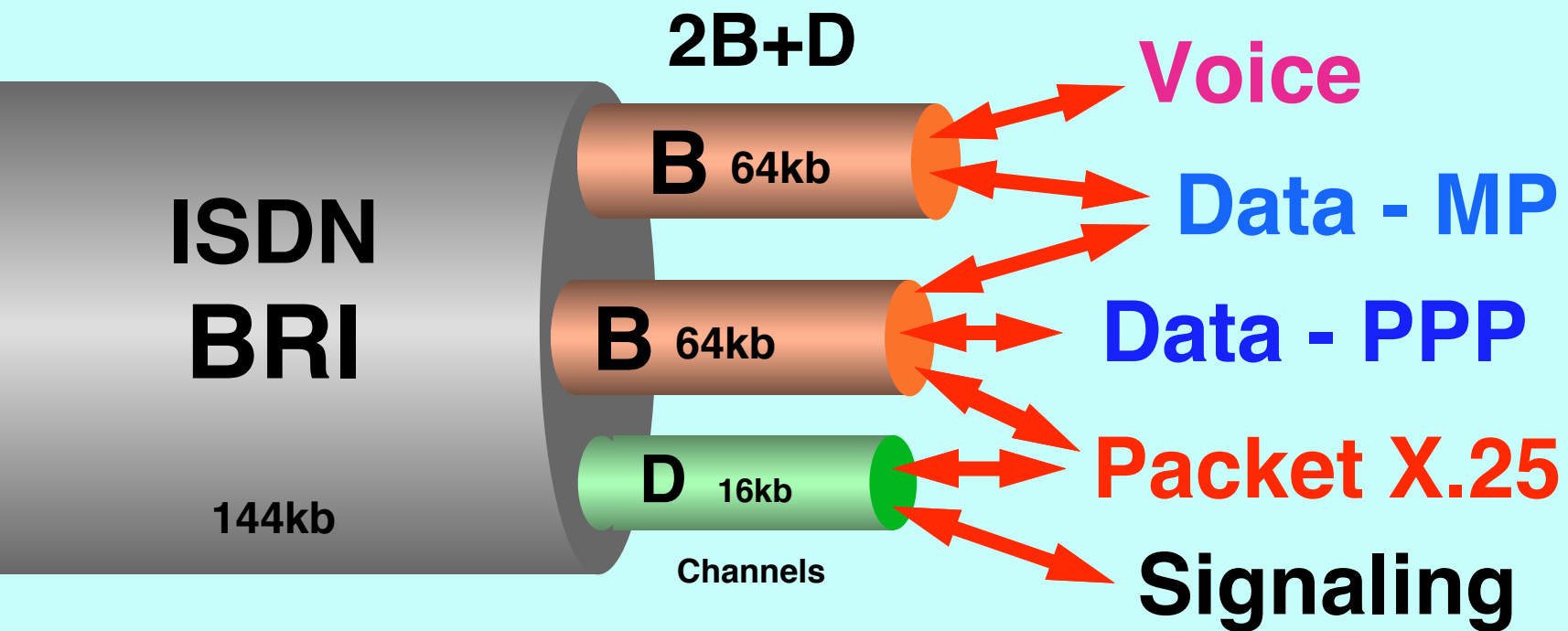


ISDN Reference Model



ISDN Basic Rate Interface

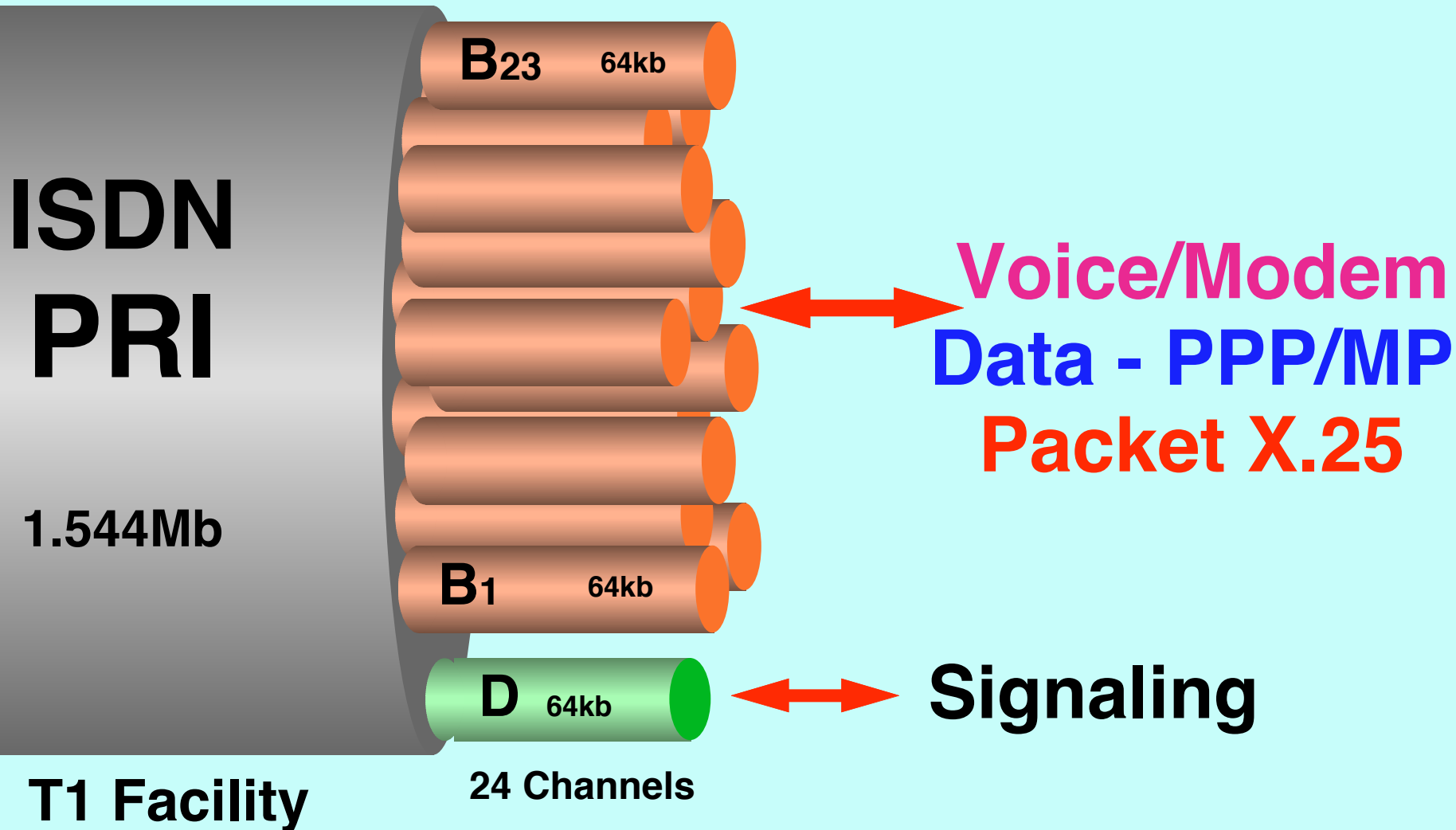
BRI



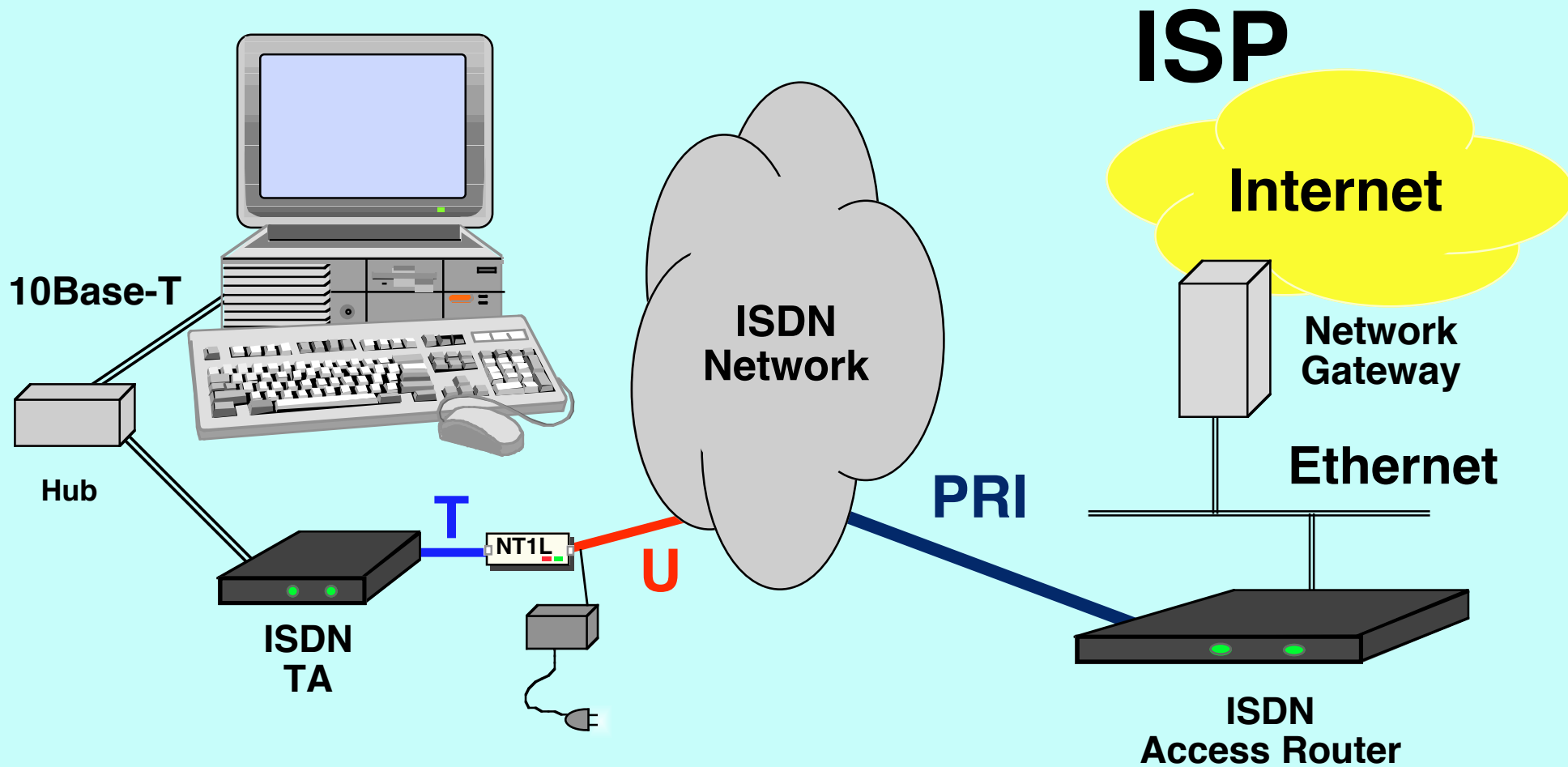
**All - Digital
Telephone Line**

ISDN Primary Rate Interface

PRI - 23B+D



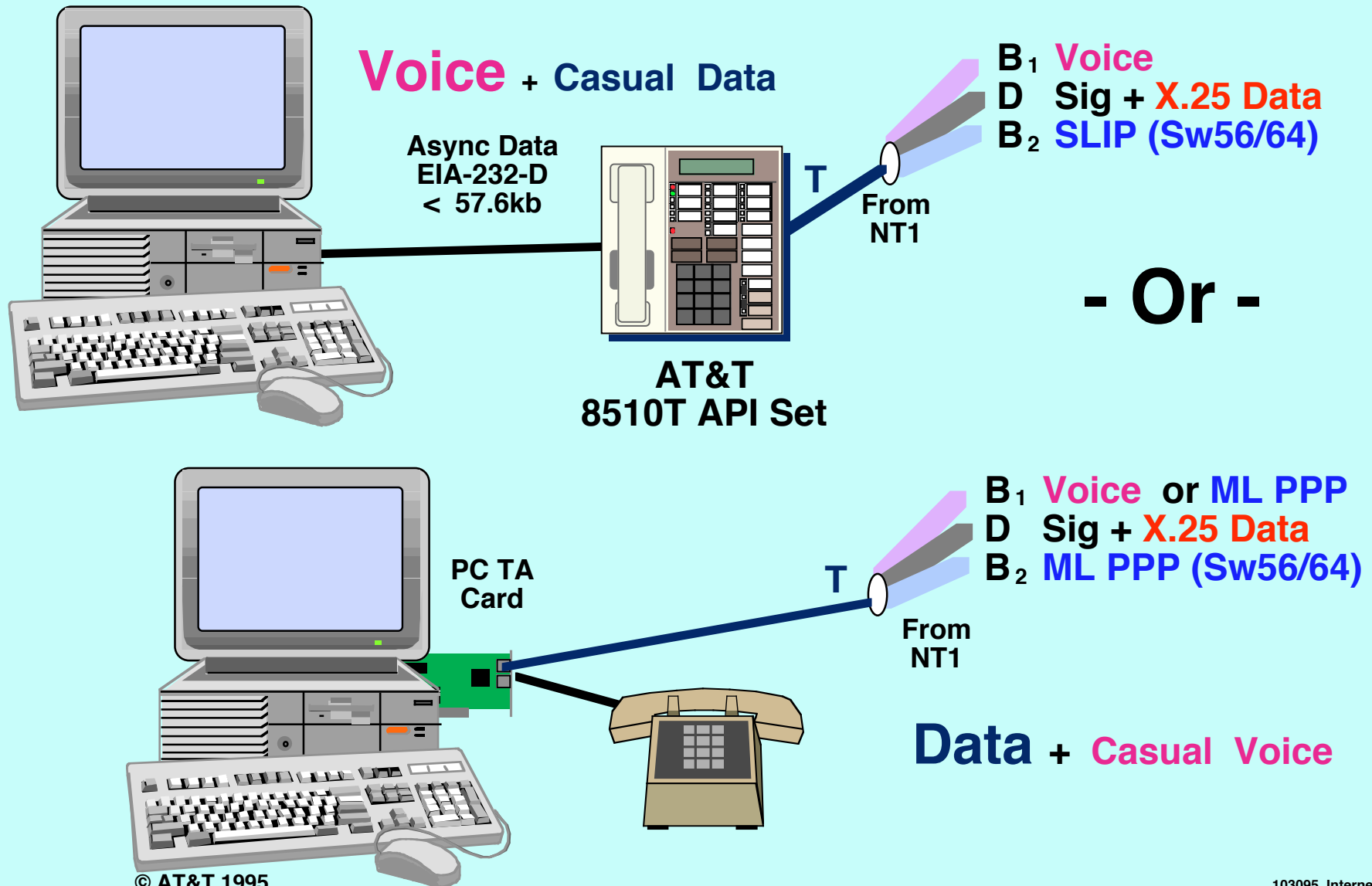
ISDN Internet Access



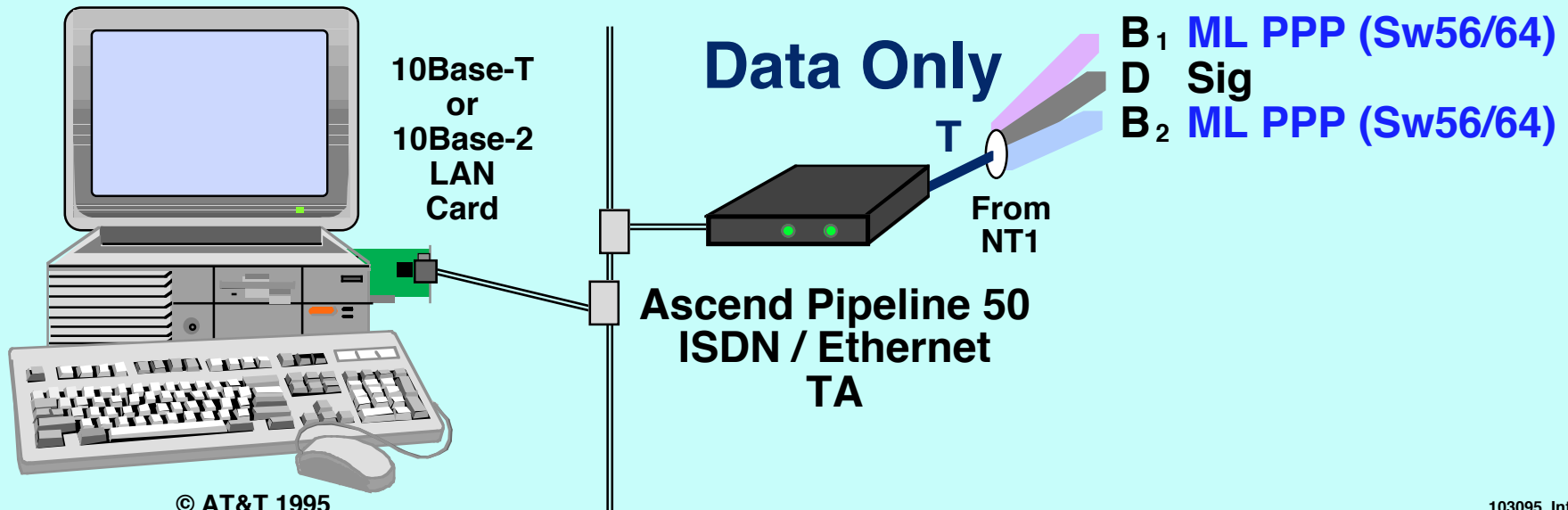
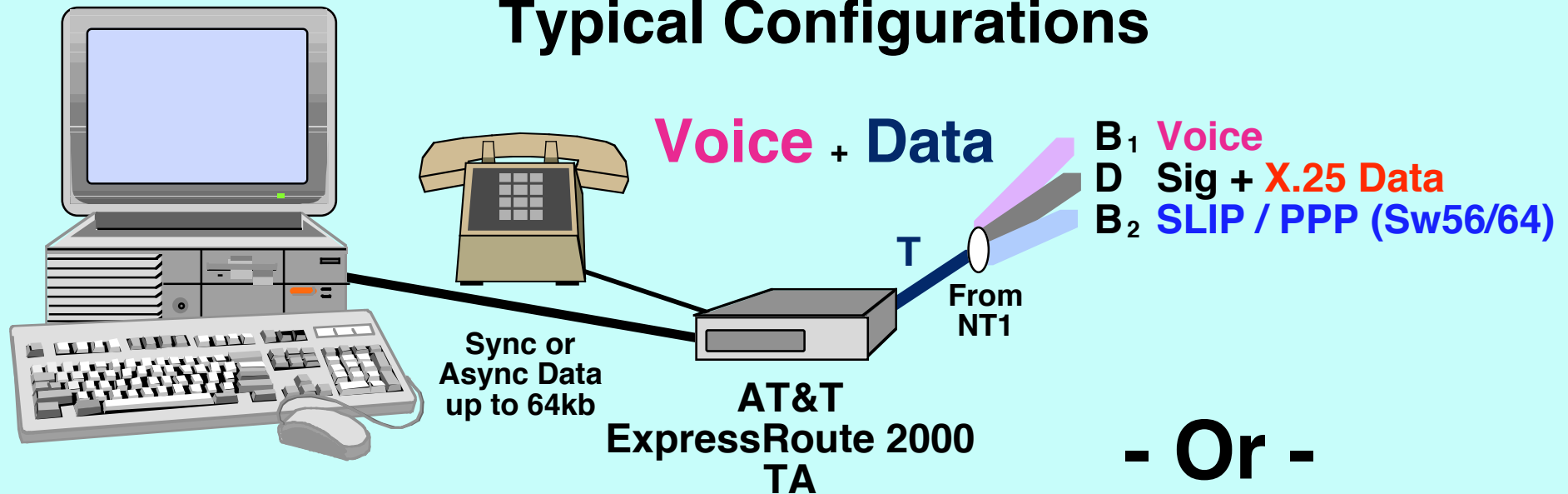
Agenda

- **ISDN Overview**
- **ISDN Configurations**
- **Communication Protocols**
- **Equipment Examples**

Basic Rate ISDN: Typical Configurations

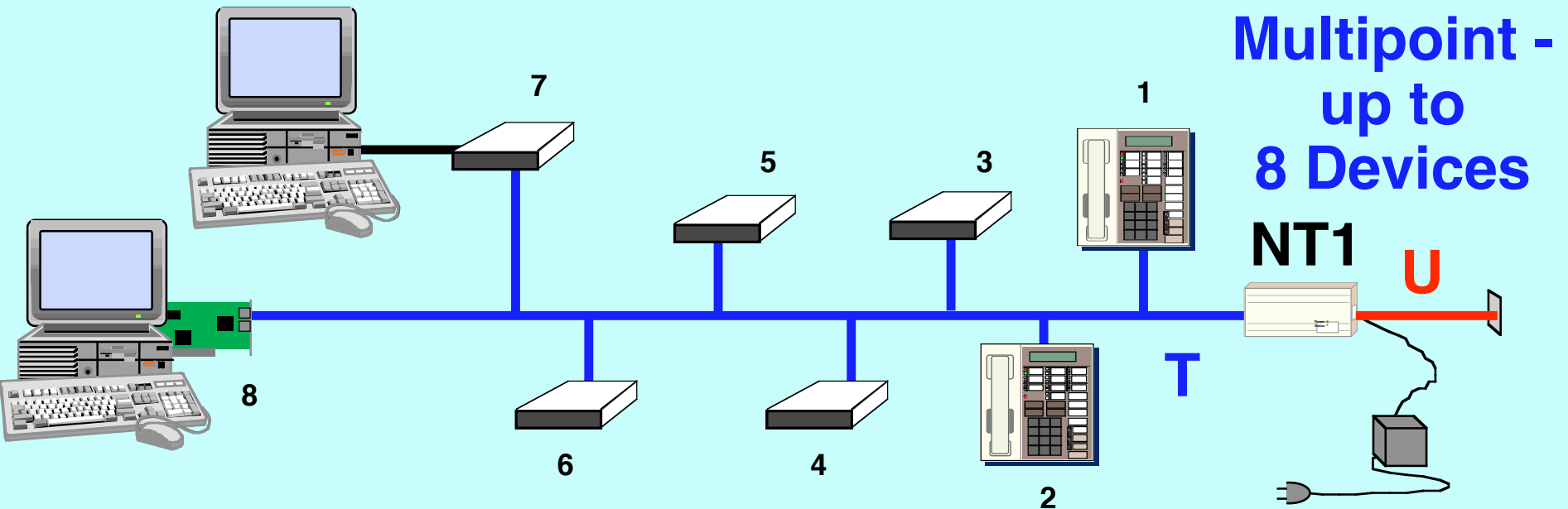
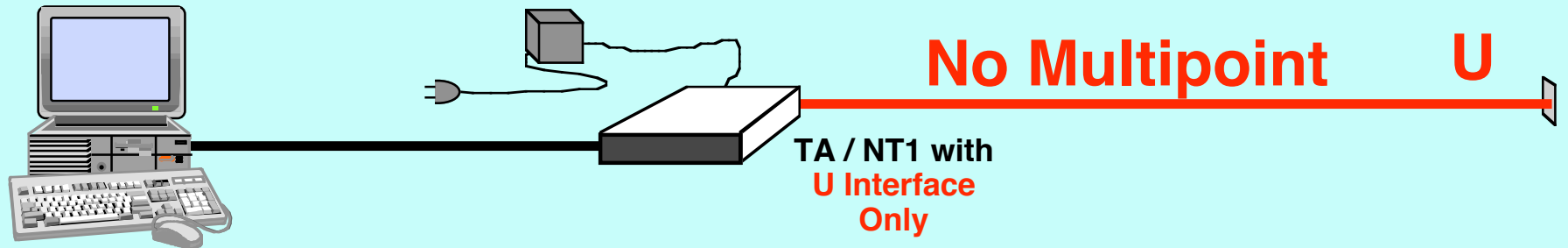


Basic Rate ISDN: Typical Configurations



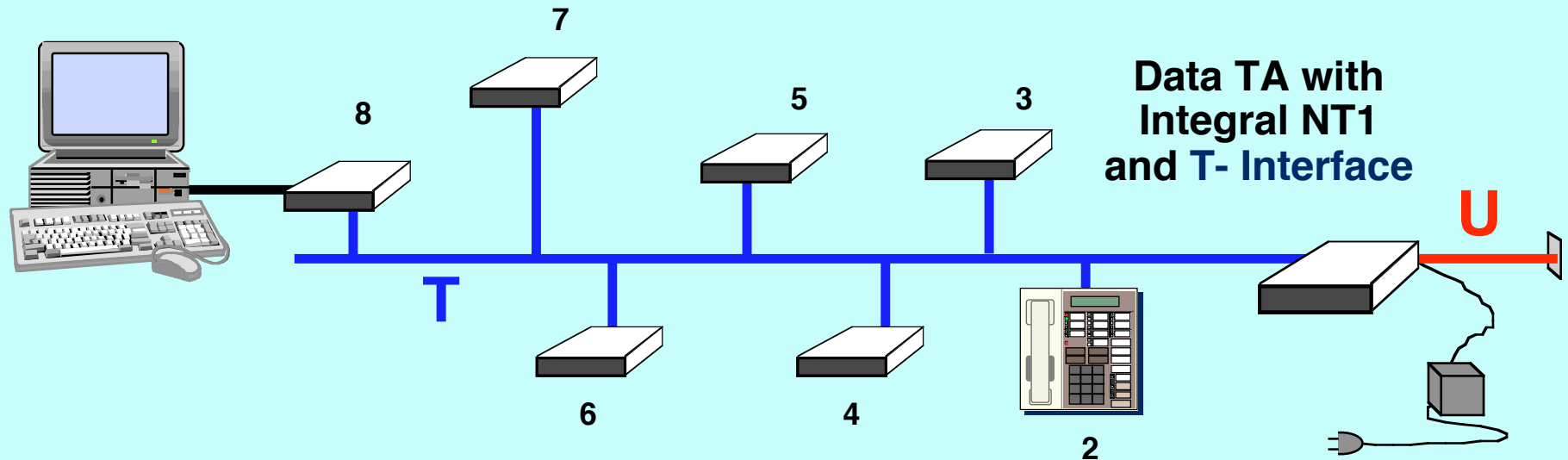
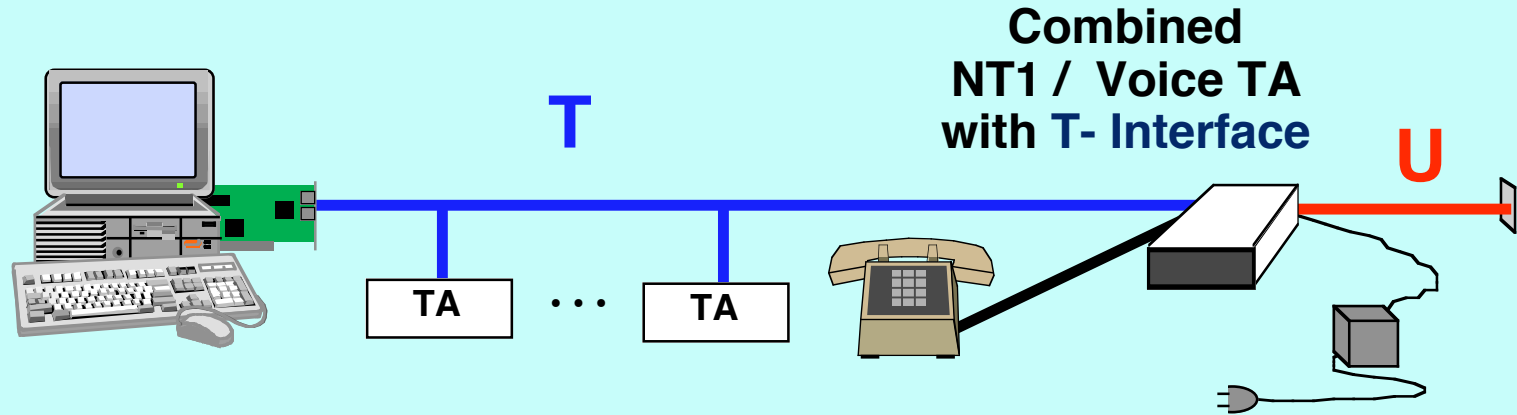
Basic Rate ISDN

MultiPoint Capability



Basic Rate ISDN

MultiPoint - Integrated NT1



ISDN Implementations

- **Primary Rate:**

- **AT&T 4 ESS™** - **PUB ISDN**
- **AT&T 5ESS®** - **Custom ISDN**
- **NTI DMS** - **Pre NI**
- **All** - **National ISDN 2 (NI-2)** ('95-'96)

- **Basic Rate:**

- **AT&T 5ESS®** - **Custom ISDN**
- **NTI DMS** - **Pre NI**
- **All** - **National ISDN 1 (NI-1)** ('92-'95)
- **All** - **National ISDN 2 (NI-2)** ('95-'96)

Agenda

- ISDN Overview
- ISDN Configurations
- **Communication Protocols**
- Equipment Examples

Communications Protocols

Single Channel

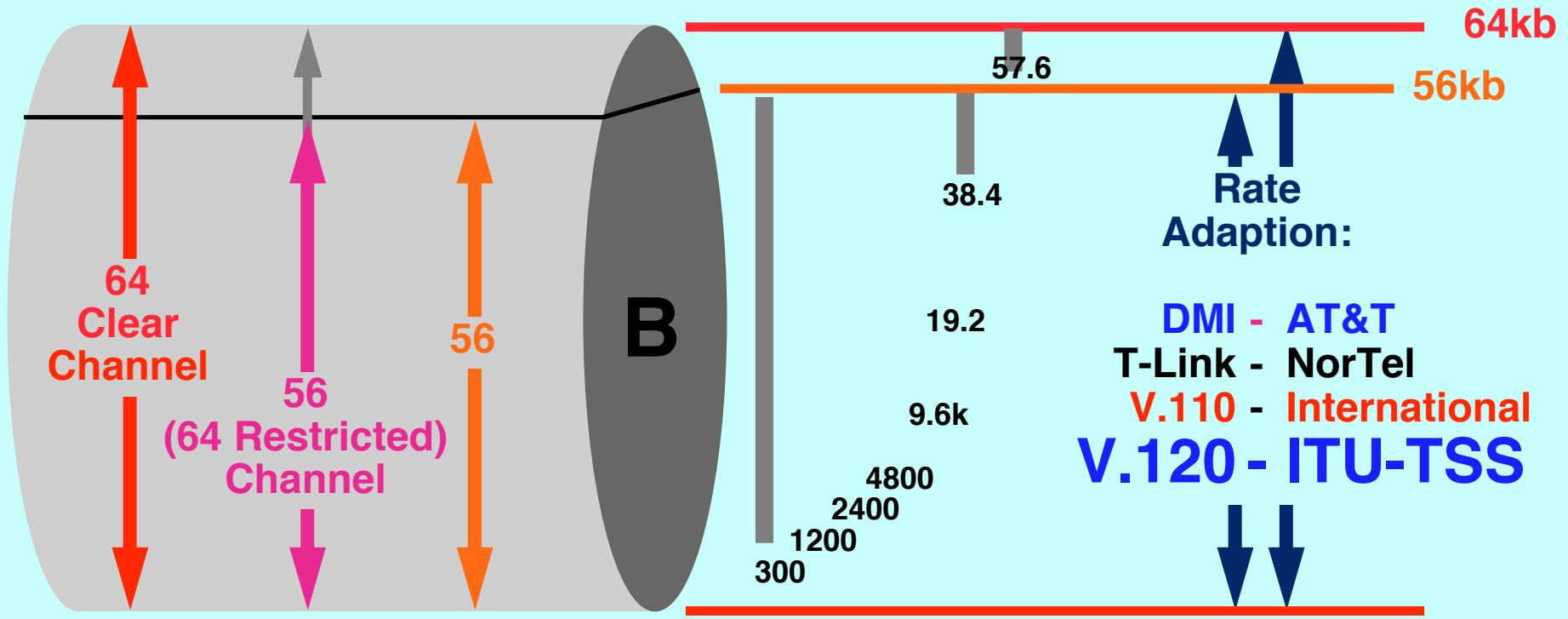
- **X.25 Packet**
- **V.120 - Async**
- **PPP**

Multiple Channel

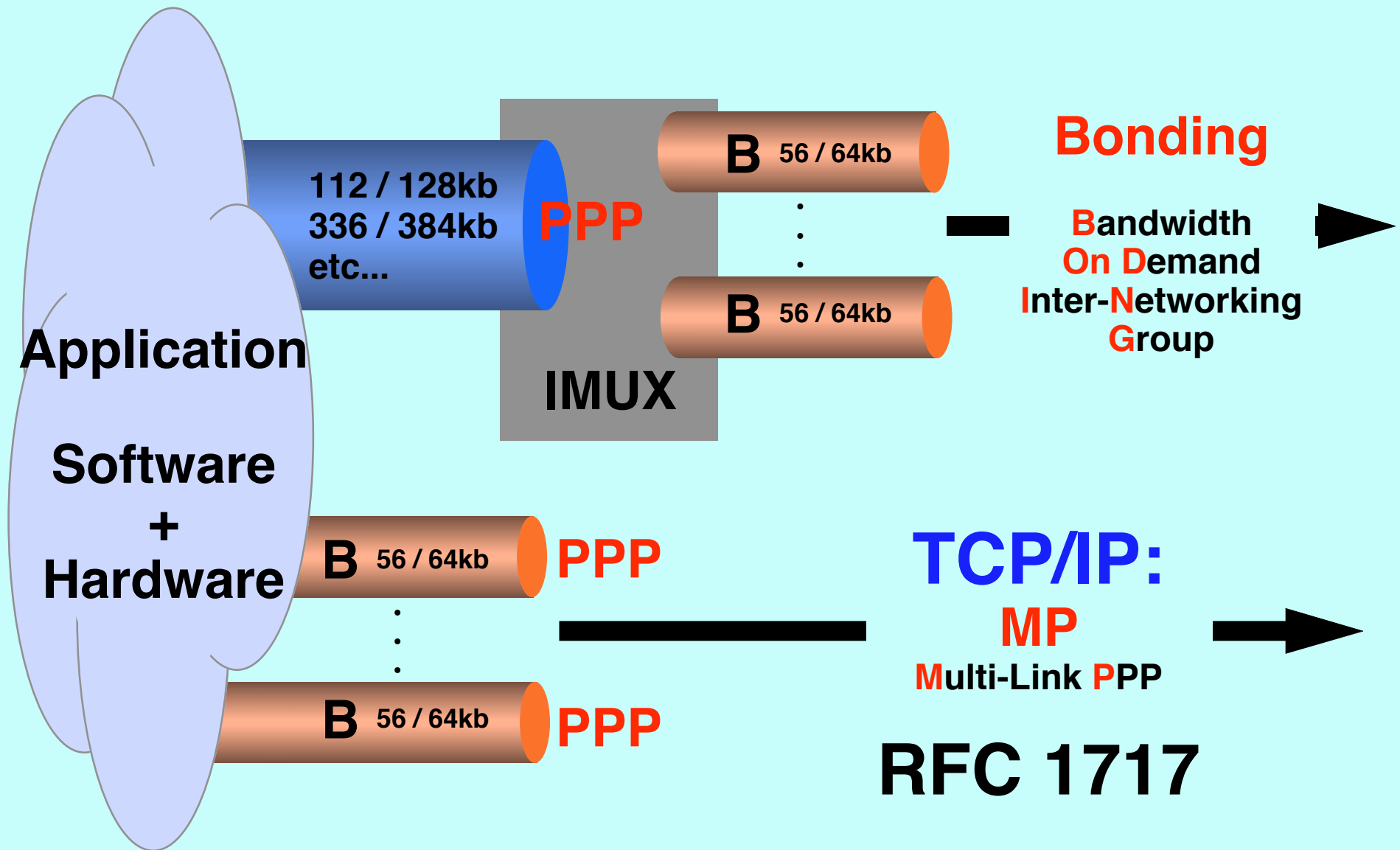
- **BONDING**
- **ML-PPP (MP) (RFC 1717)**

B-Channel Rate Adaption

For Async
RS-232C or EIA-232-D



Multiple Channel Calls



Agenda

- ISDN Overview
- ISDN Configurations
- Communication Protocols
- **Equipment Examples**

ISDN Equipment

- **3Com**
- **Ascend**
- **Cisco**
- **DigiBoard**
- **Farallon**
- **Gandalf**
- **IBM**
- **knx**
- **Motorola**
- **Network Express**

Starting Points

- **ISDN Equipment**

<http://alumni.caltech.edu/~dank/isdn>

- **Telephone Service Provider**

<http://www.bellcore.com>

- **Internet Access Service Provider**

InterNex, PSInet, CERFnet etc...

CIUG

Interoperability Testing

- **CIUG + Pacific Bell**
- **Over 30 vendors**
- **PPP MP and CCP testing**
- **<http://www.ciug.org>**

“Must Know” BRI Parameters

- **For the ISDN Line:**
 - Switch Type & Software Release
 - National ISDN (**NI-1, NI-2, NI-95/96/97**) or “**Custom**”
 - **ANSI-U 2B1Q** or **T** interface
- **For Each ISDN Device**
 - Primary DN (Directory Number) & any others
 - **SPID** - **S**ervice **P**rofile **I**dentifier
 - » Required for Multipoint, for NI, and for some switch types
 - » Equipment to Bearer Services
 - » SPID may apply per Device or per Bearer Capability
 - Unique **Data**, **Packet**, and **Voice** capabilities per SPID

End of Presentation

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Internet World

E4

ISDN

Service Providers

4:15 pm - 5:15 pm
October 30, 1995

RICHARD BRENNAN

TECHNOLOGY MANAGER

AT&T Network Systems

San Ramon, CA

email: rbrennan@attmail.com

http://www. image2000.com



Agenda

- ISDN Review

- **I₂SP ...**

ISDN Internet Service Providers

- Commercial
- Corporate
- Educational

- **LEC - Local Telephone Companies**
- **Long Distance Carriers - IEC**

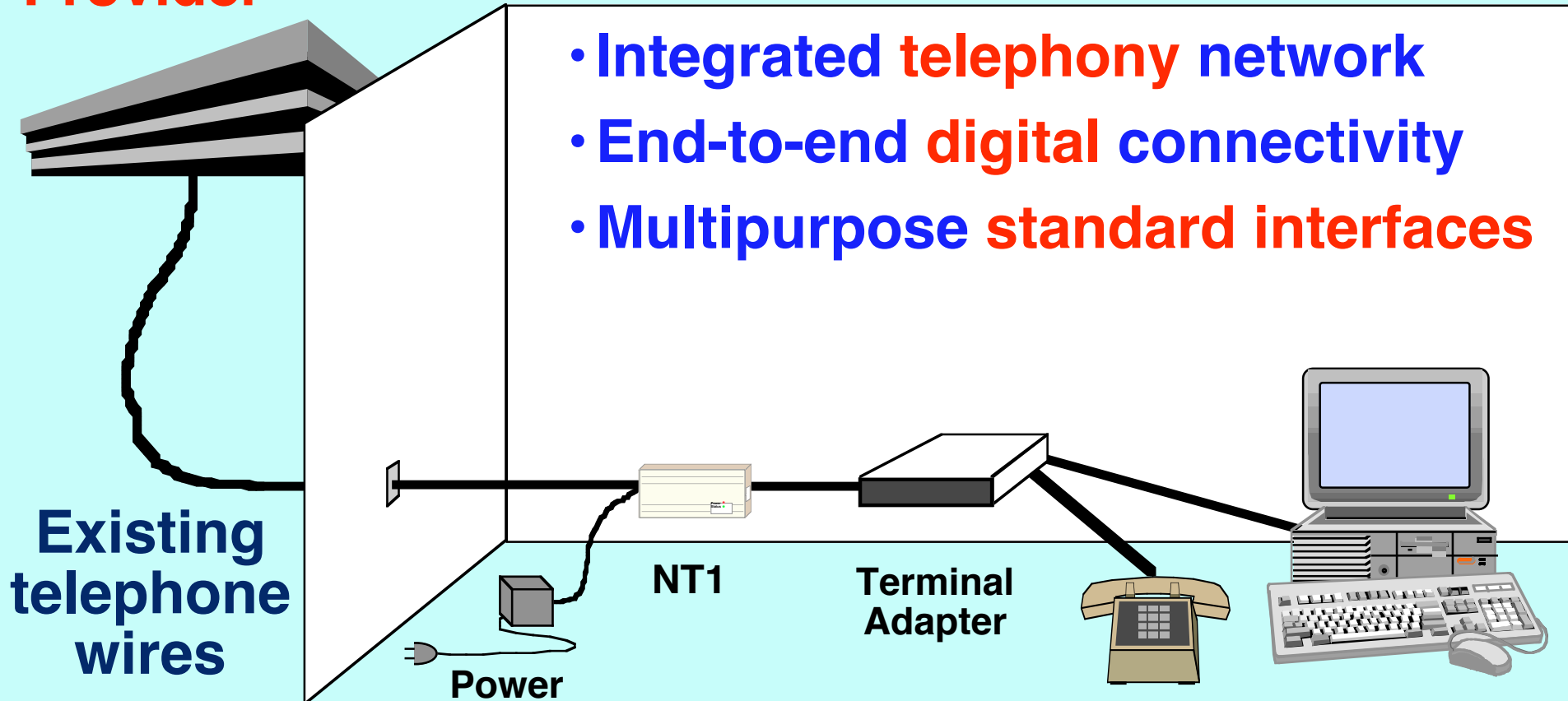
Integrated Services Digital Network

ISDN Definition:

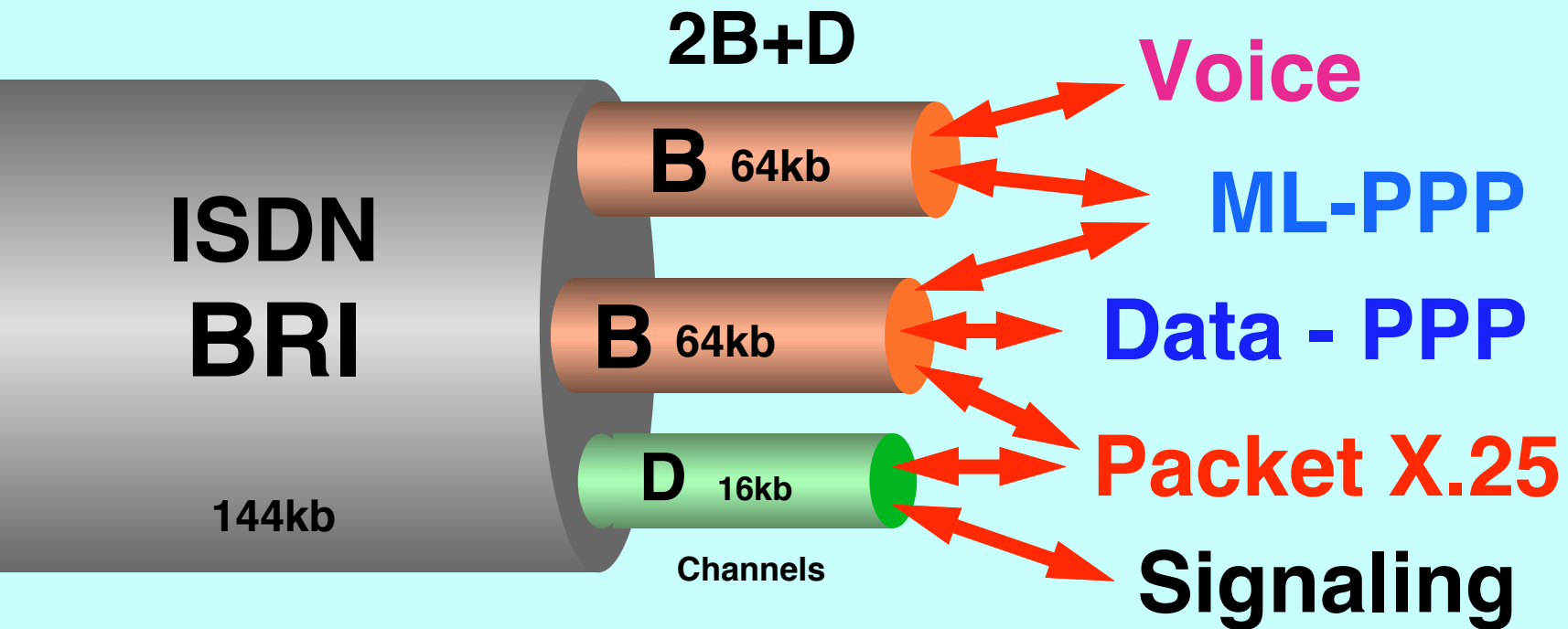
ITU -TSS Standard

Service
Provider

- Integrated **telephony** network
- End-to-end **digital** connectivity
- Multipurpose **standard** interfaces



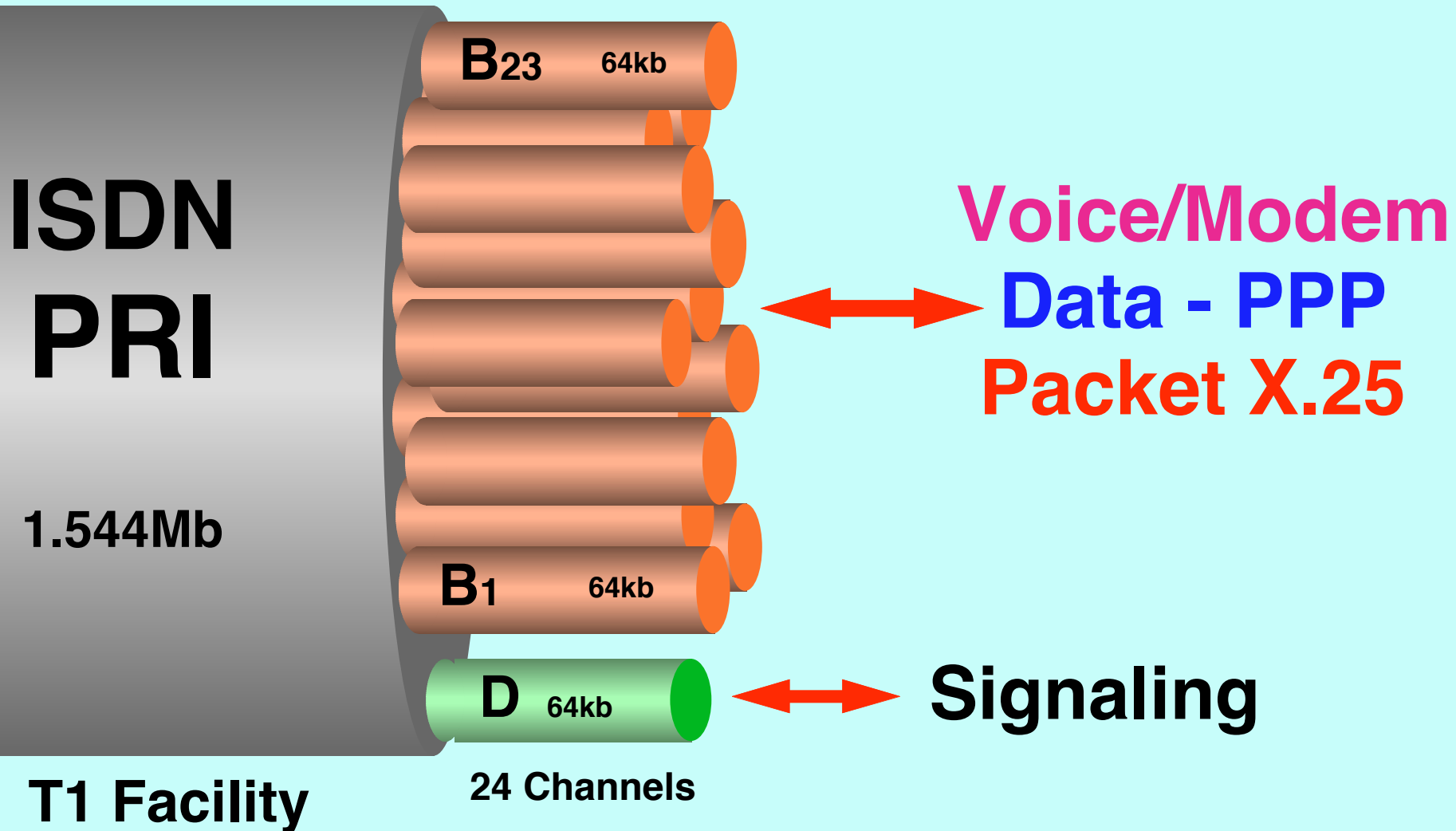
ISDN Basic Rate Interface BRI



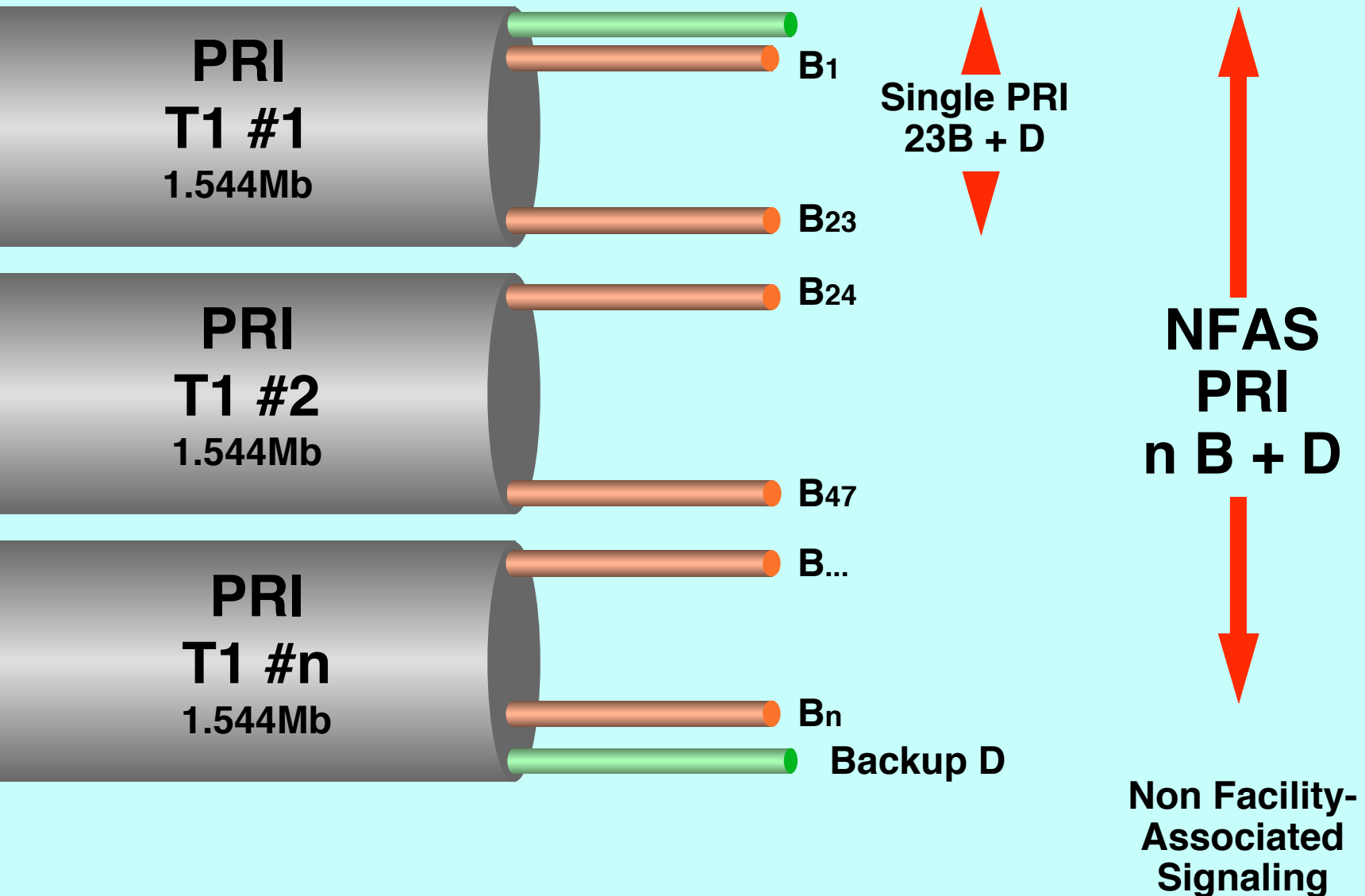
**All - Digital
Telephone Line**

ISDN Primary Rate Interface

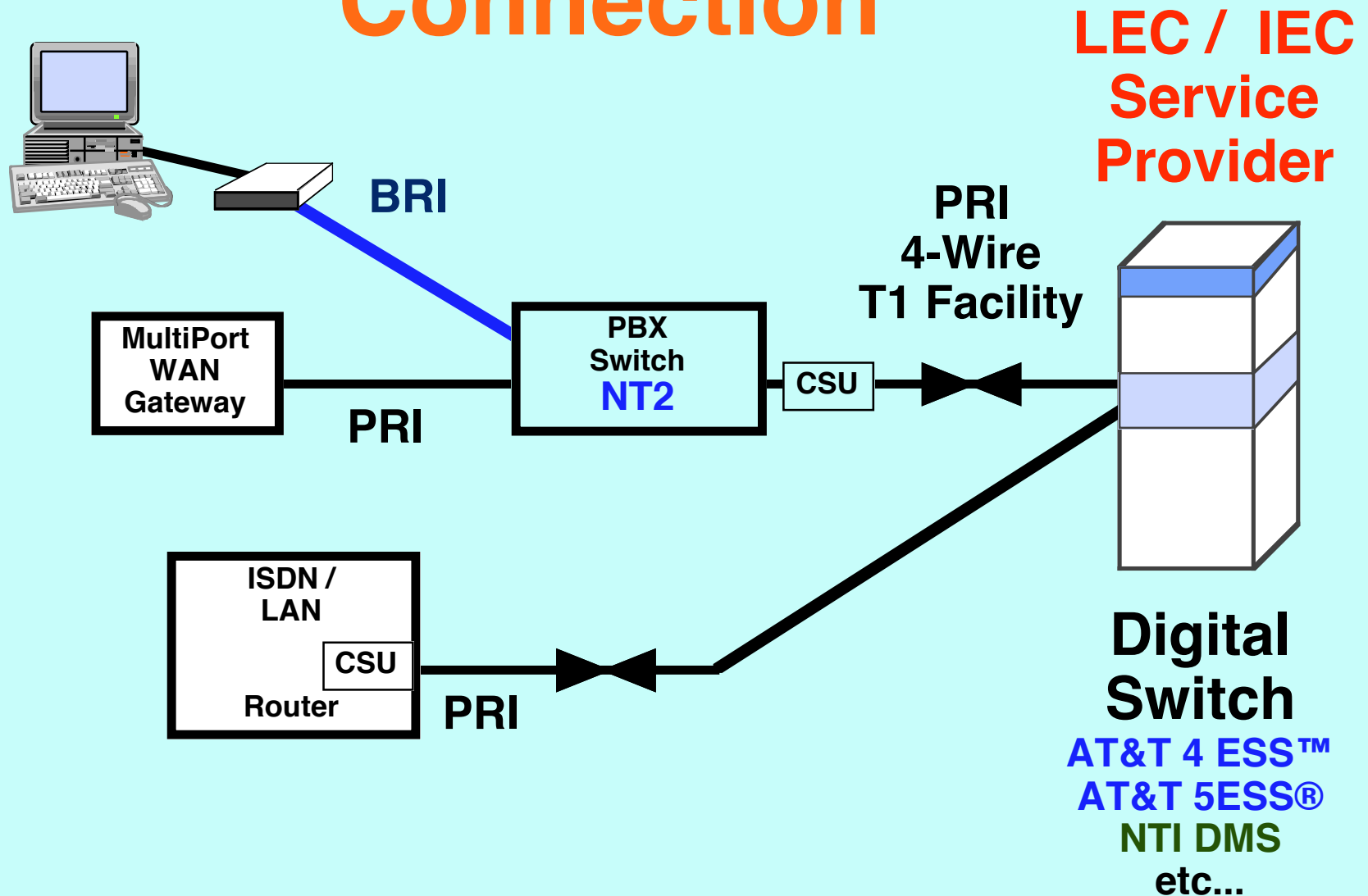
PRI - 23B+D



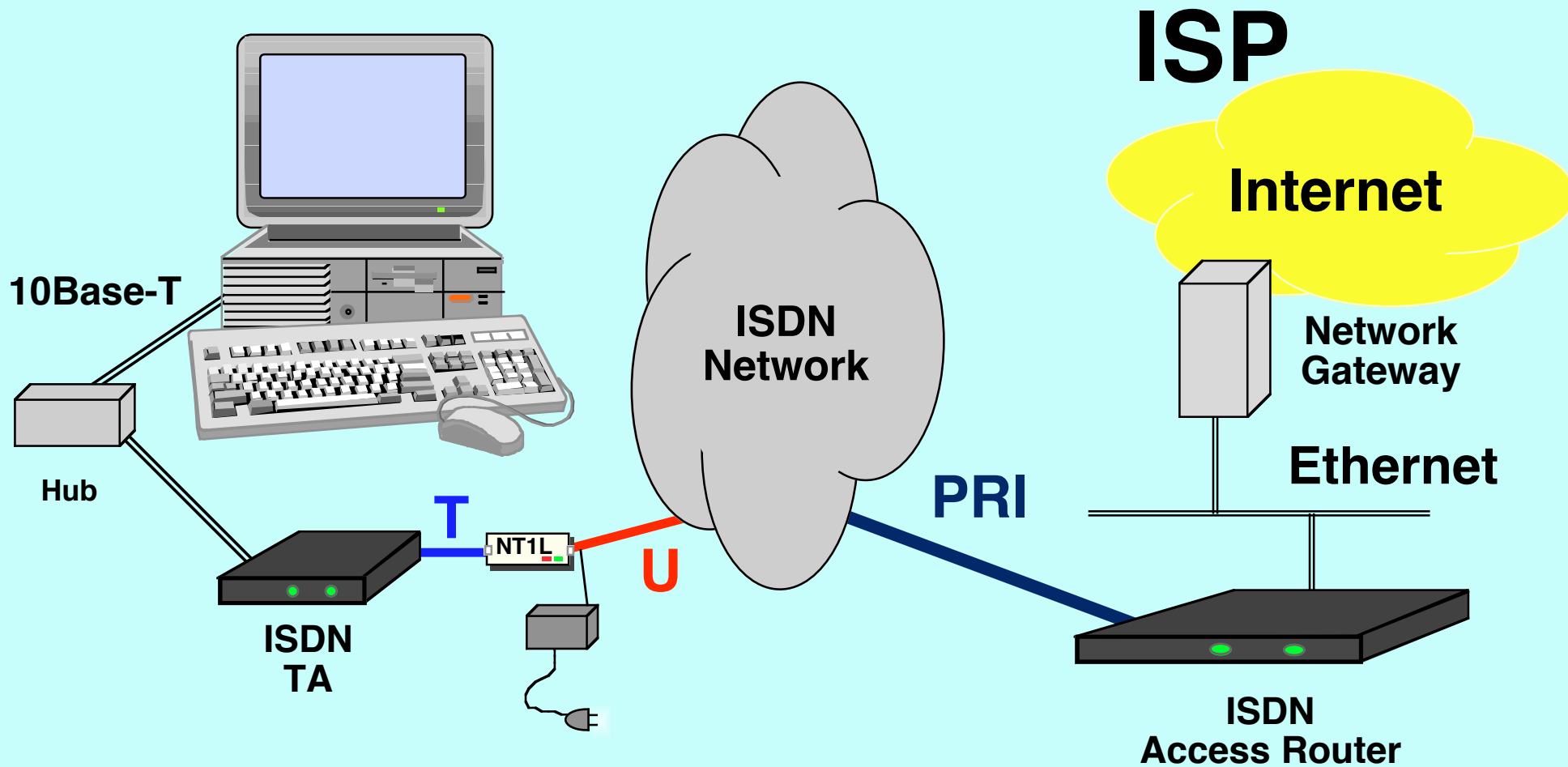
PRI Configurations



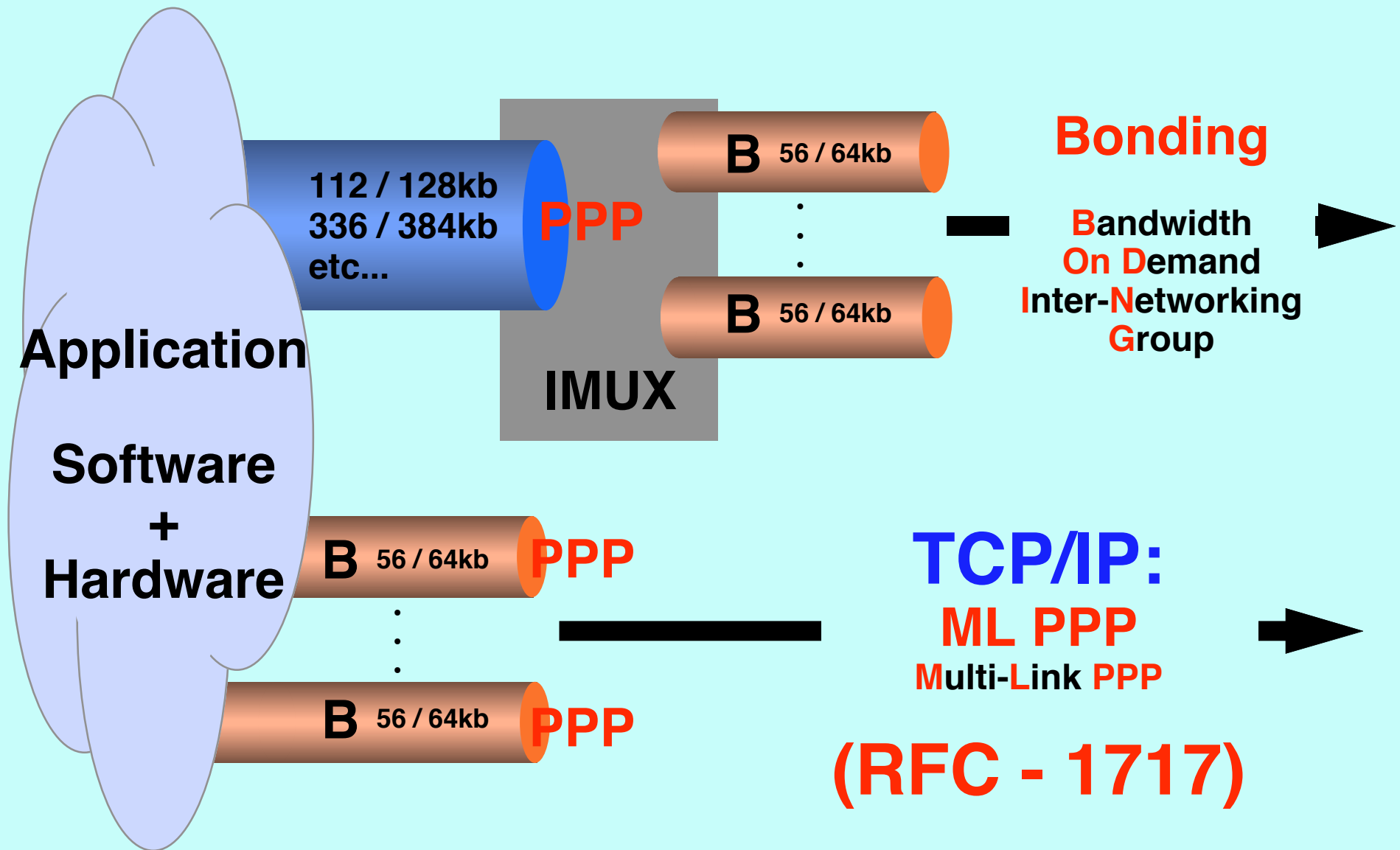
PRI Network Connection



ISDN Internet Access



Multiple Channel Calls



Agenda

- ISDN Review

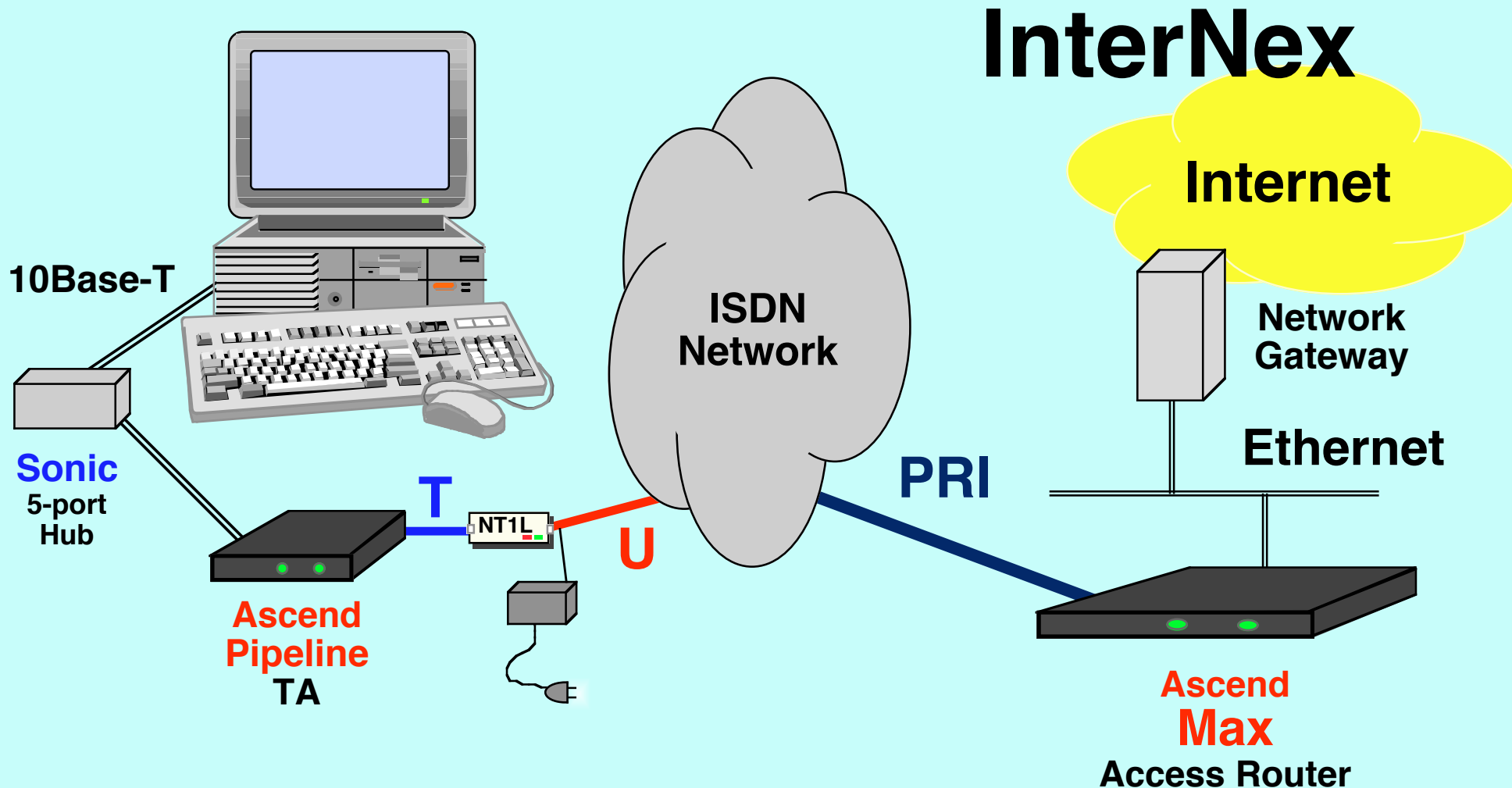
- **I₂SP ...**

ISDN Internet Service Providers

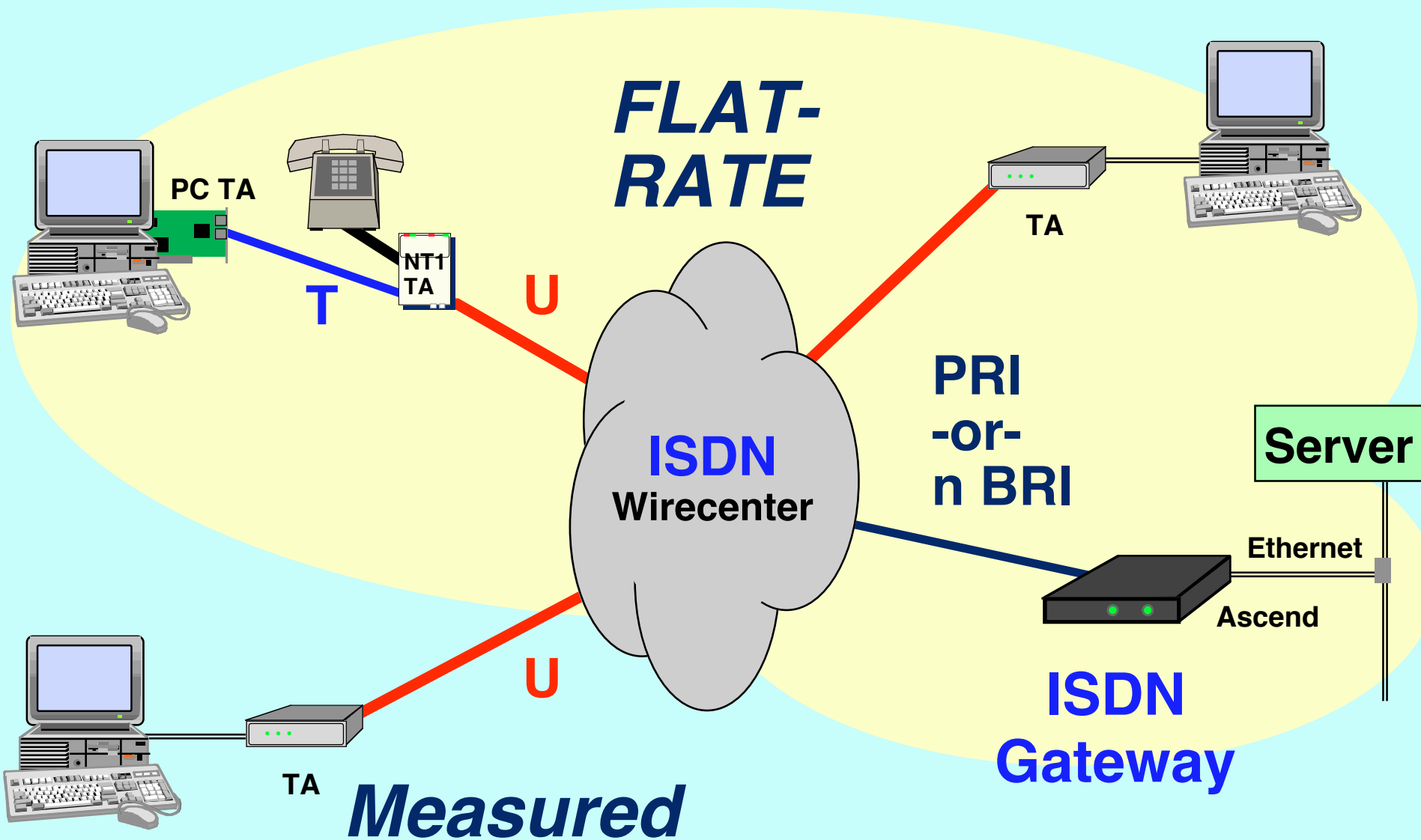
- Commercial
- Corporate
- Educational

- **LEC - Local Telephone Companies**
- **Long Distance Carriers - IEC**

Commercial Internet Access

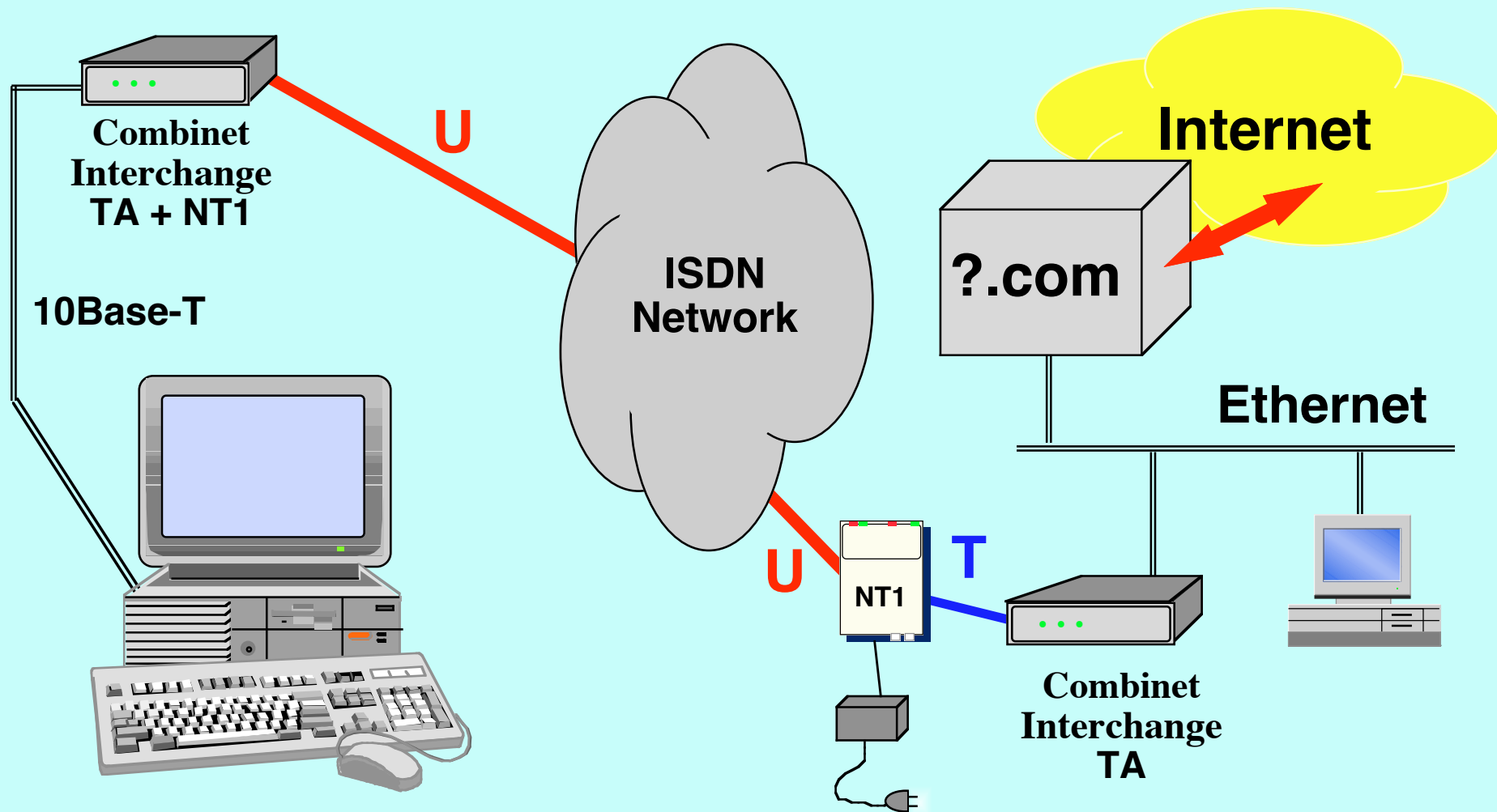


Internet "Centrex"



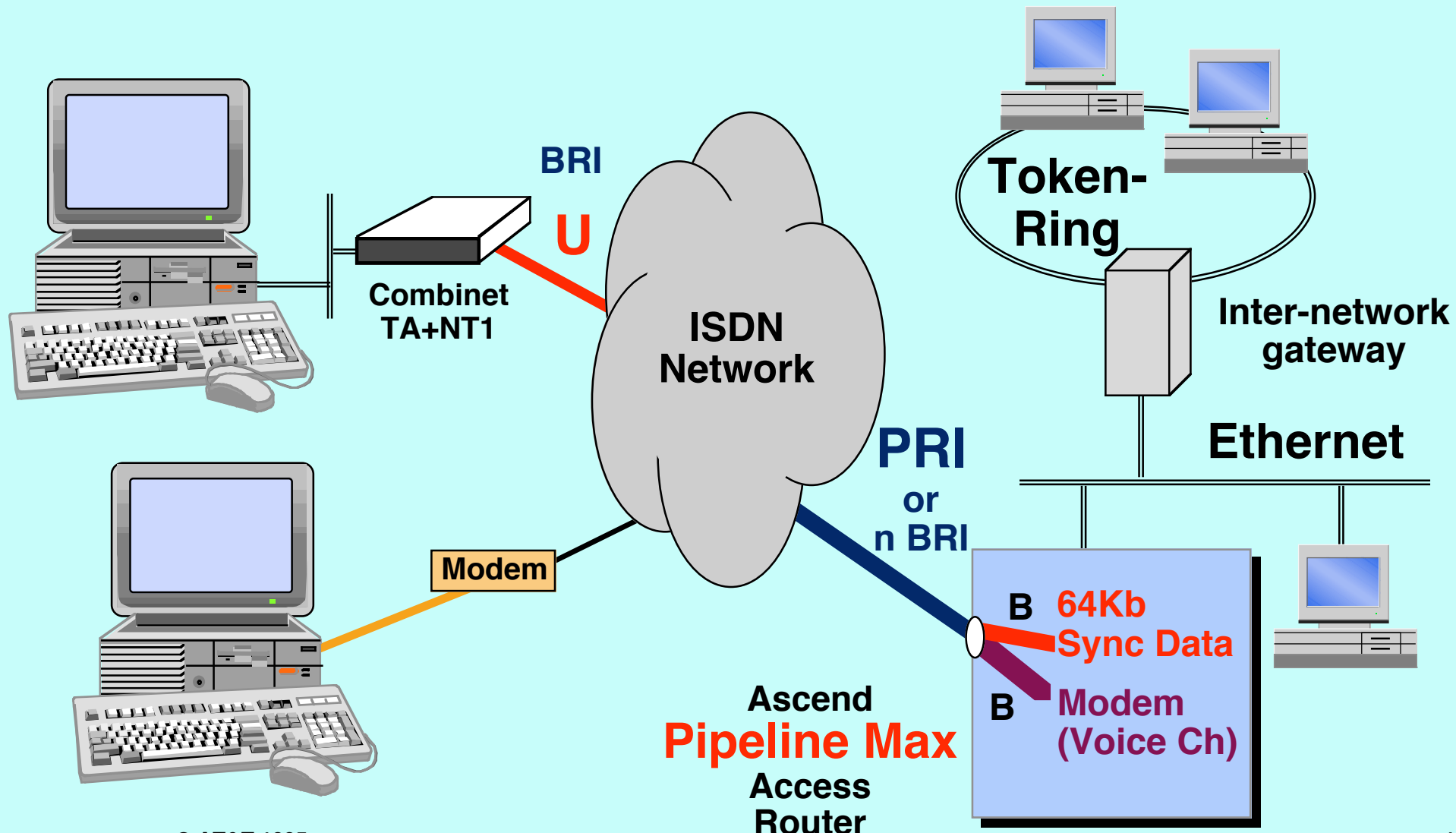
Corporate LAN Access

TeleCommunting Bridge



Data Center Integration

Async Modem + Sync LAN Access



Agenda

- ISDN Review
- I₂SP ...
 - ISDN Internet Service Providers
 - Commercial
 - Corporate
 - Educational
- **LEC - Local Telephone Companies**
- **Long Distance Carriers - IEC**

LEC ISDN Services

Local Telephone Service

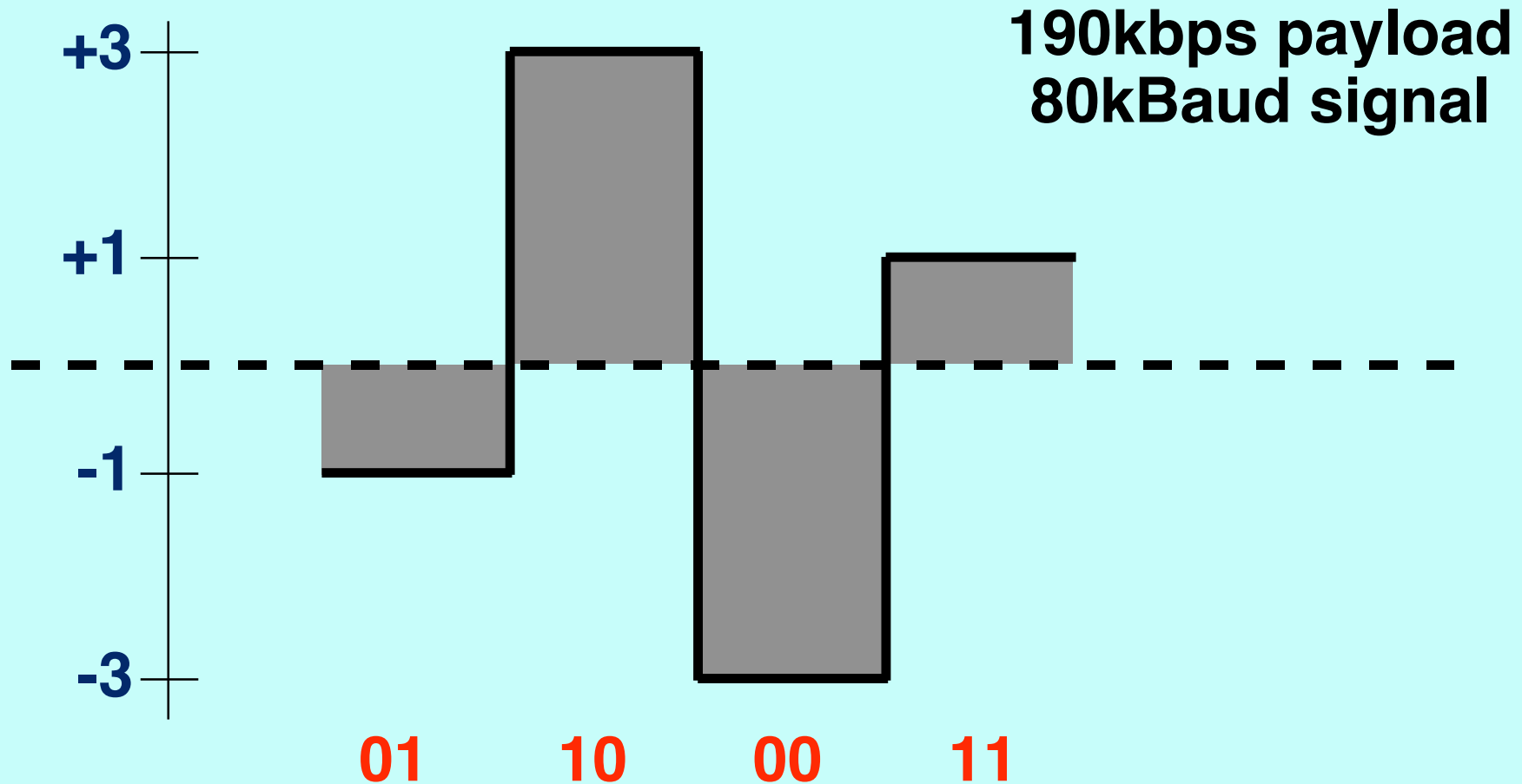
- **NYNEX**
- **SNET**
- **Pacific Bell**
- ... et al

ISDN “U” Interface

- **2-Wire** Connection from Local Digital Switch
- National Standard:
ANSI Standard T1.601: **2B1Q Line coding**
- Supports “Long” Local Loops
 - < 46dB loss budget (~ 18,000 - 22,000 ft)
 - Loop Repeaters needed for longer loops
- Mnemonic: **U = “Universal Service” (2-wire)**

ANSI 2B1Q Interface

2-Binary - 1 Quaternary

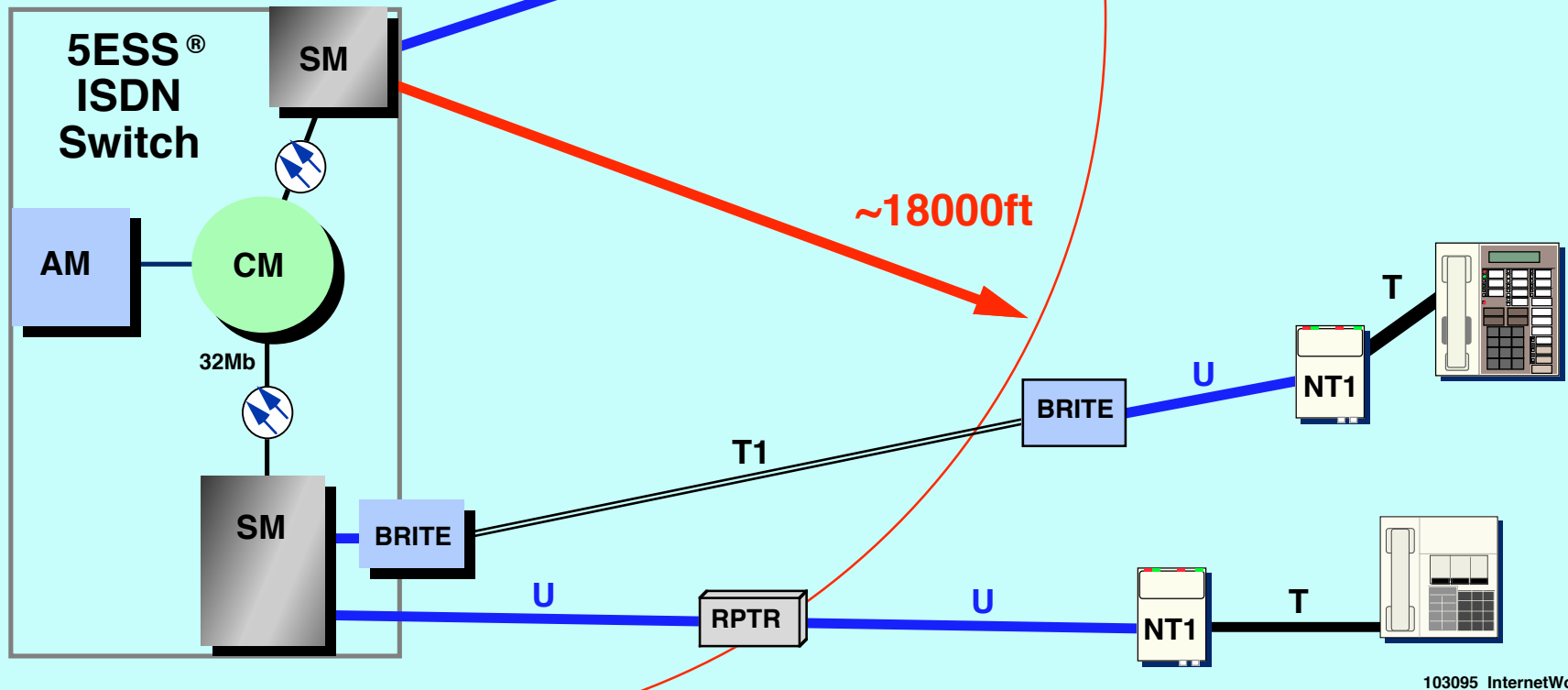


ISDN Loop Arrangements

“ISDN Anywhere” Policy

PACIFIC BELL

Central Office



ISDN “T” Interface

- **4-Wire** Connection from NT1 (or NT2)
- ITU-TSS Standard: I.430
- Supports “Short” Wiring Plans
 - < 6dB loss budget (~ 100 - 500+ ft)
 - Not protected for Outside Wiring Use
- **Multipoint** capability supports up to **8* devices** on passive bus
- Mnemonic: **T = “Two Pairs”** (4-wire)

* Depending on Switch Implementation

ISDN Implementations

- **Primary Rate:**

- **AT&T 4 ESS™** - **PUB ISDN**
- **AT&T 5ESS®** - **Custom ISDN**
- **NTI DMS** - **Pre NI**
- **All** - **National ISDN 2 (NI-2)** ('95-'96)

- **Basic Rate:**

- **AT&T 5ESS®** - **Custom ISDN**
- **NTI DMS** - **Pre NI**
- **All** - **National ISDN 1 (NI-1)** ('92-'95)
- **All** - **National ISDN 2 (NI-2)** ('95-'96)

“Must Know” BRI Parameters

- **For the ISDN Line:**
 - Switch Type & Software Release
 - Custom or National ISDN (NI-1, NI-2)
 - ANSI-U 2B1Q or T interface (or older AMI-U)
- **For Each ISDN Device**
 - Primary DN (Directory Number) & any others
 - **SPID- Service Profile Identifier**
 - » Required for Multipoint, for NI, and for some switch types
 - » Uniquely associates Equipment to Bearer Services
 - » SPID may apply per Device or per Bearer Capability
 - Unique Data, Packet, and Voice capabilities per SPID

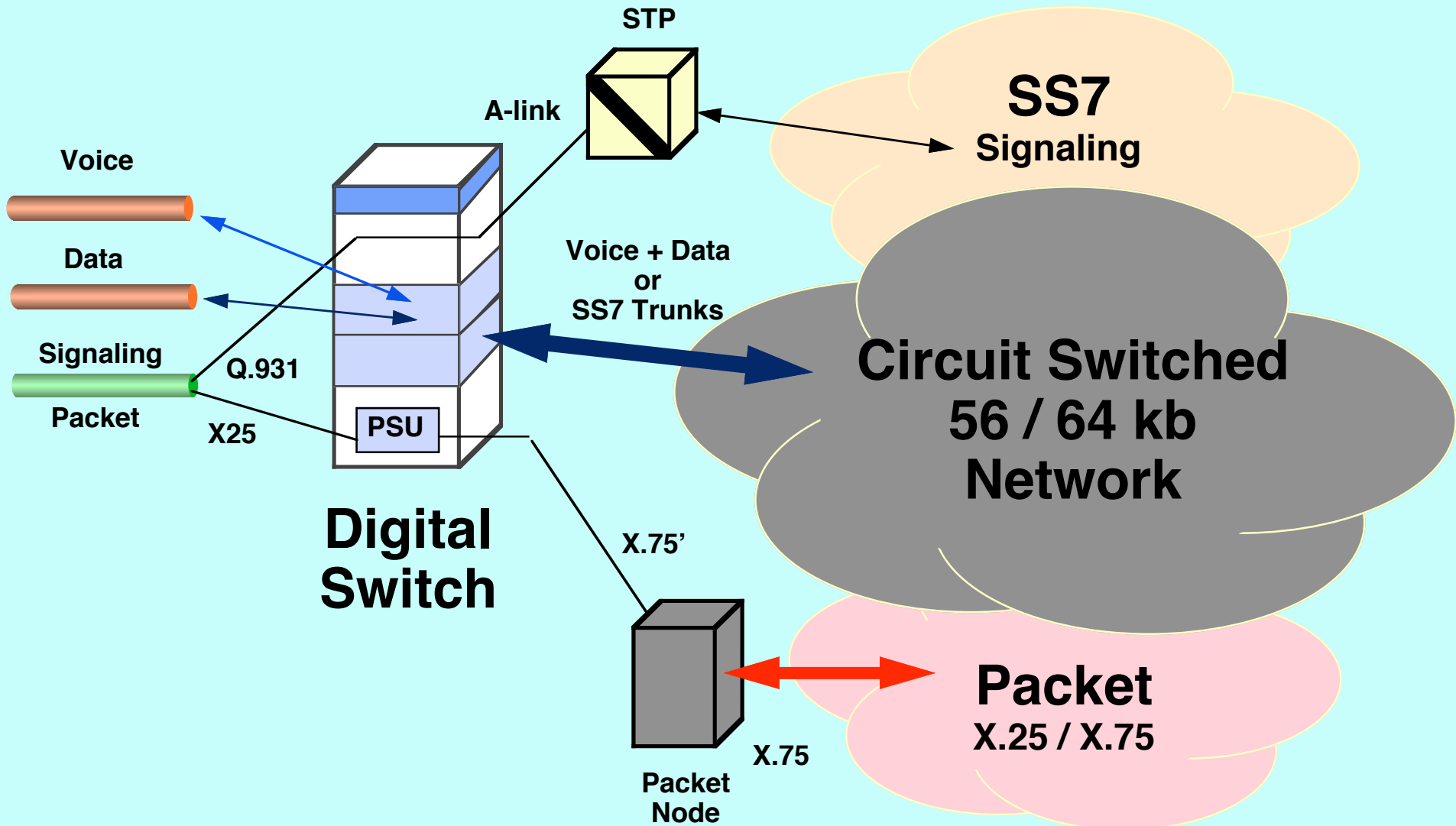
Agenda

- ISDN Review
- I²SP ...

ISDN Internet Service Providers

- Commercial
- Corporate
- Educational
- LEC - Local Telephone Companies
- Long Distance Carriers - IEC

ISDN Network Model



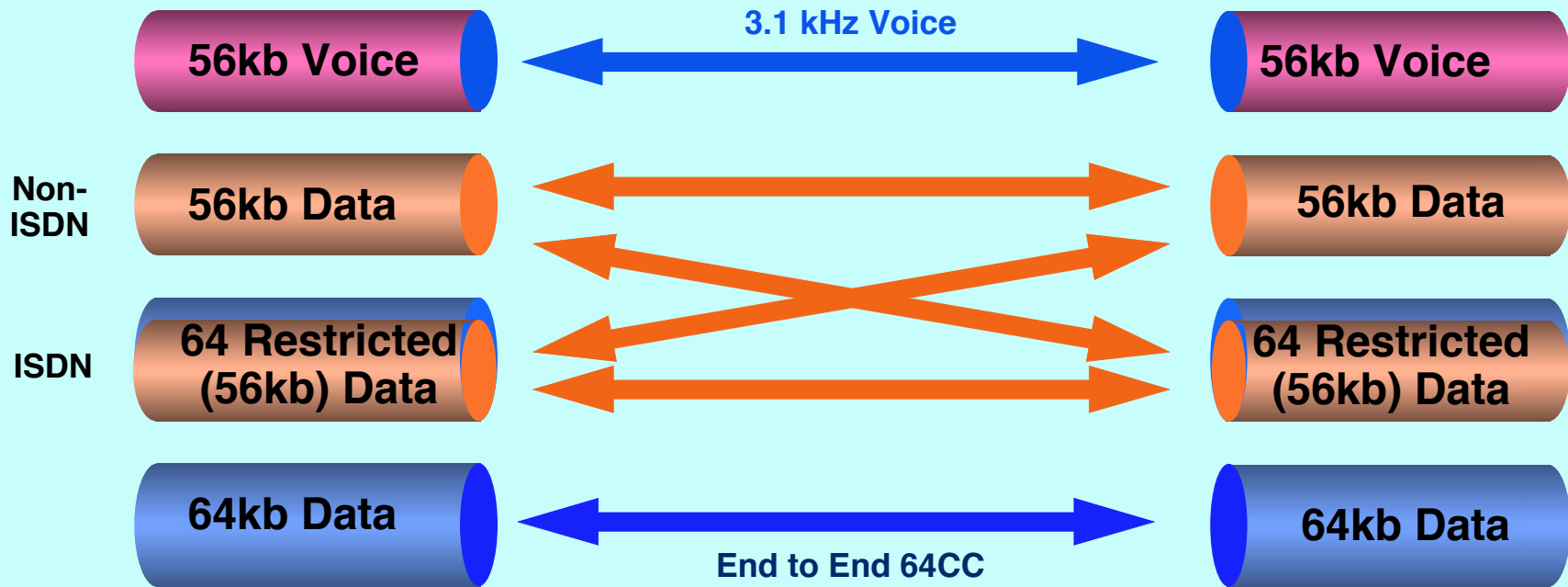
IEC ISDN Services

Interexchange Carriers

- **AT&T**
- **MCI**
- **Sprint**

- **International**

56 / 64kb Interworking



Starting Points

- **ISDN Equipment**

<http://alumni.caltech.edu/~dank/isdn>

- **Telephone Service Provider**

<http://www.bellcore.com>

- **Internet Access Service Provider**

InterNex, PSInet, CERFnet etc...

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Internet World

E5

ISDN At Home

4:15 pm - 5:15 pm
October 30, 1995

RICHARD BRENNAN

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<http://www.image2000.com>



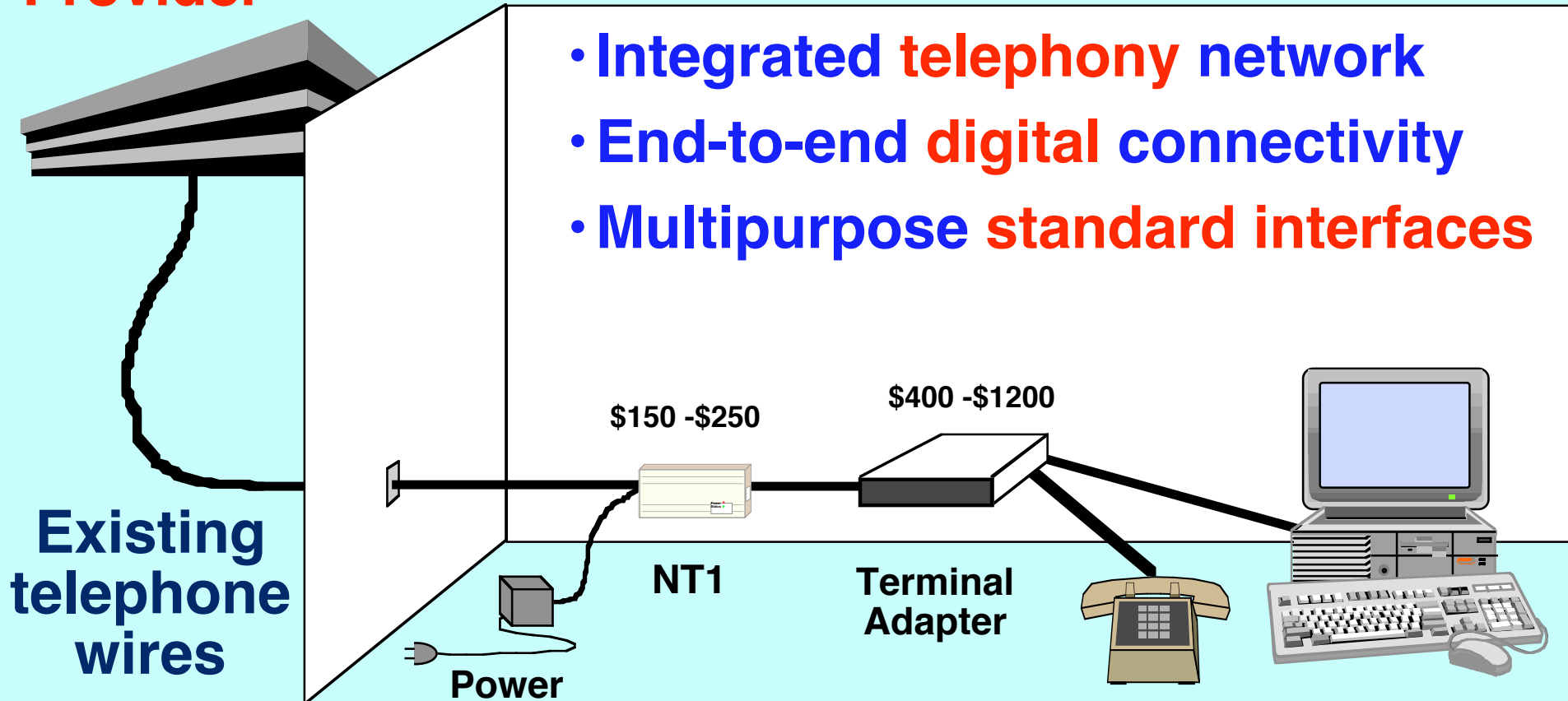
Integrated Services Digital Network

ISDN Definition:

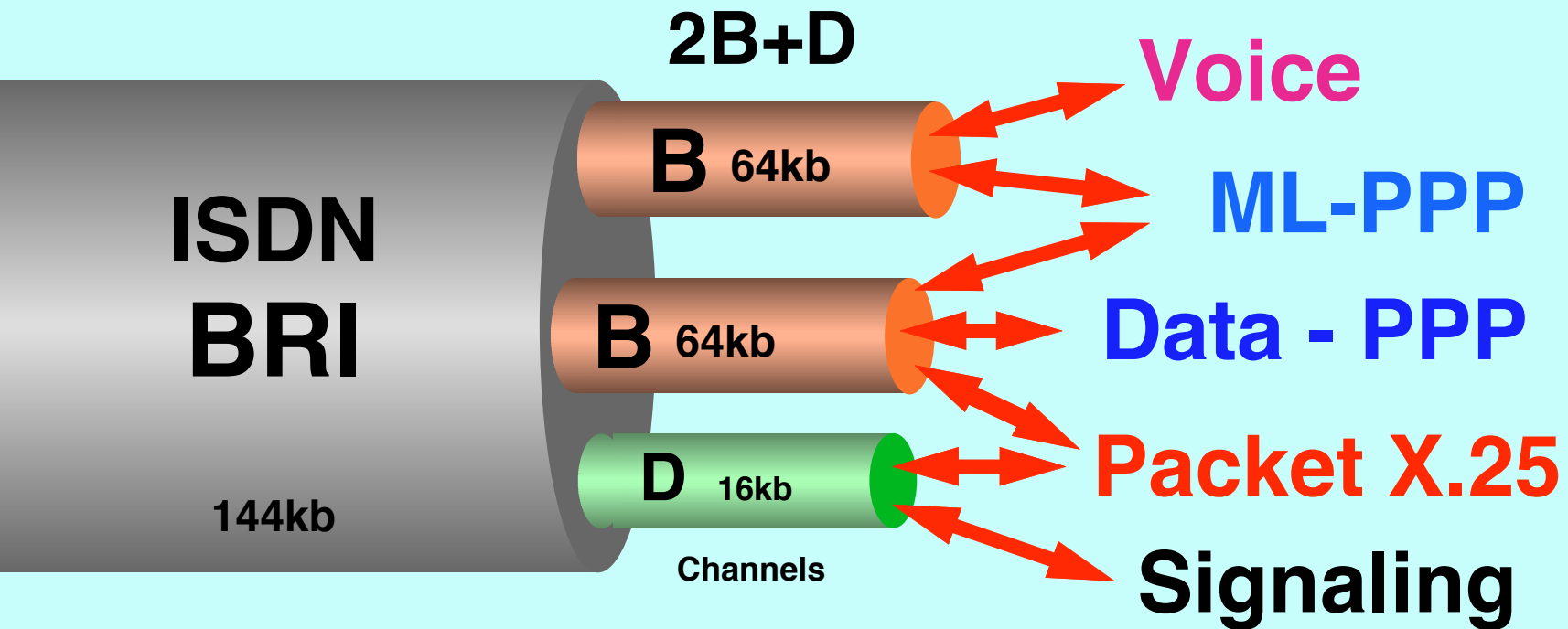
ITU -TSS Standard

Service
Provider

- Integrated **telephony** network
- End-to-end **digital** connectivity
- Multipurpose **standard** interfaces

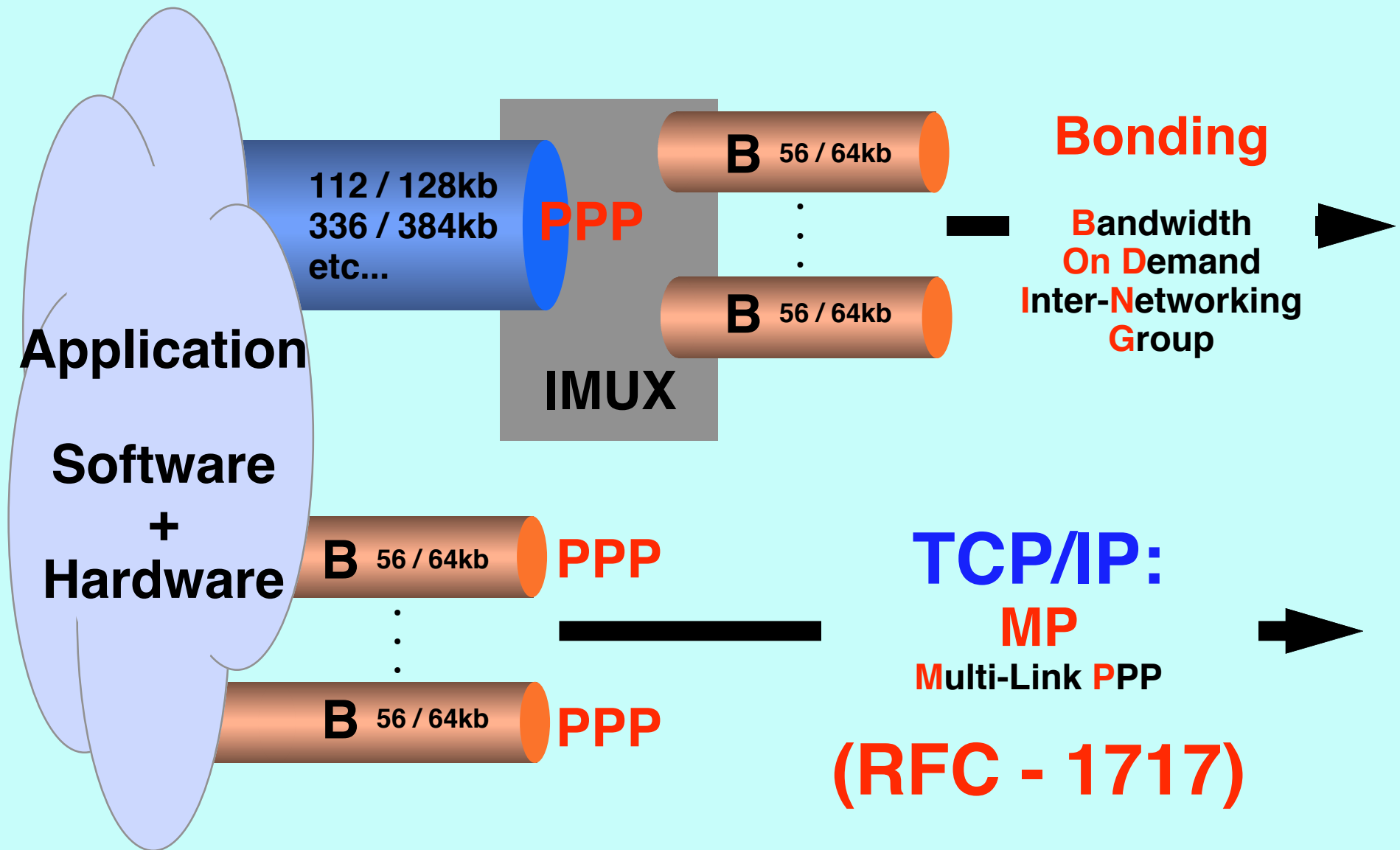


ISDN Basic Rate Interface BRI

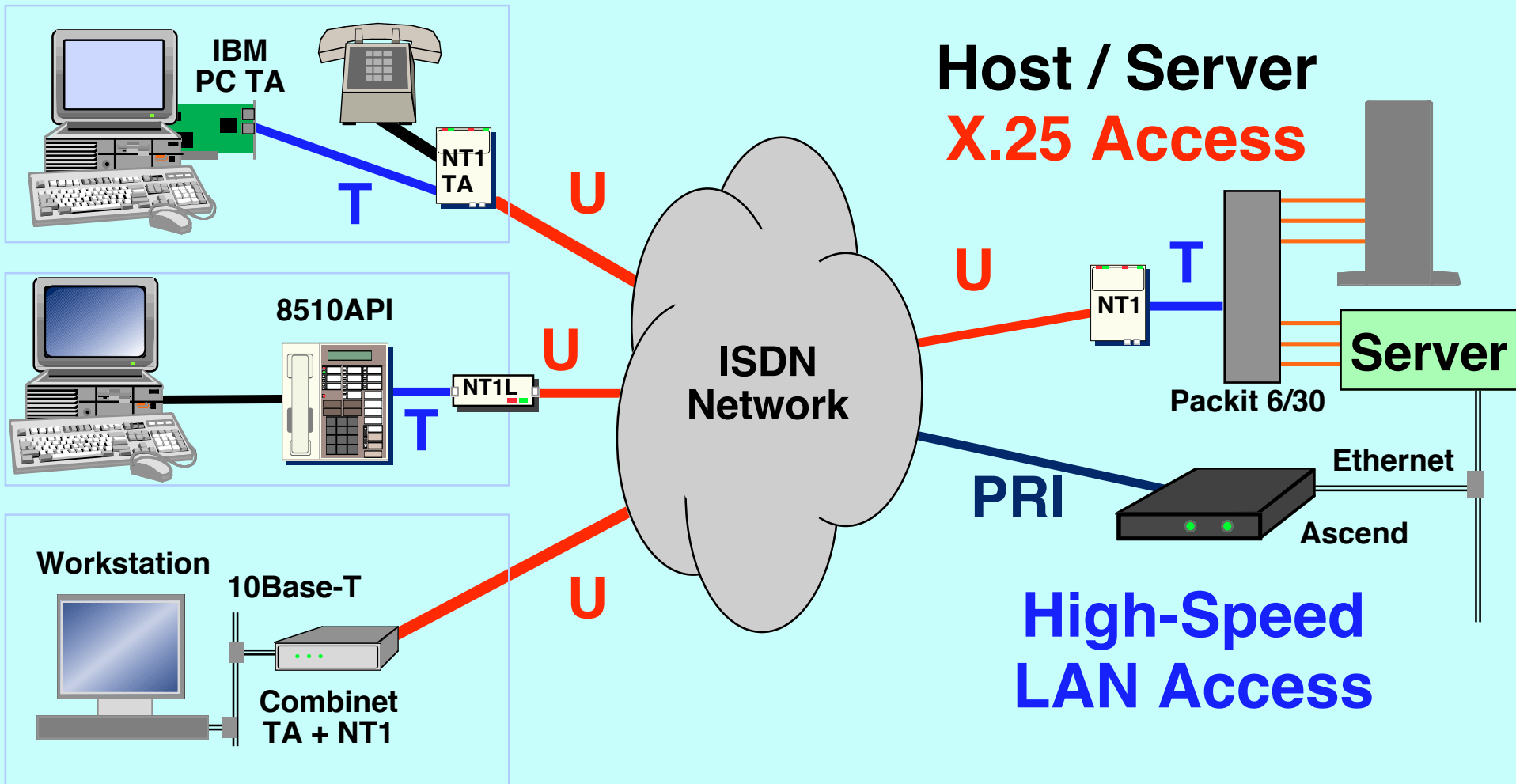


**All - Digital
Telephone Line**

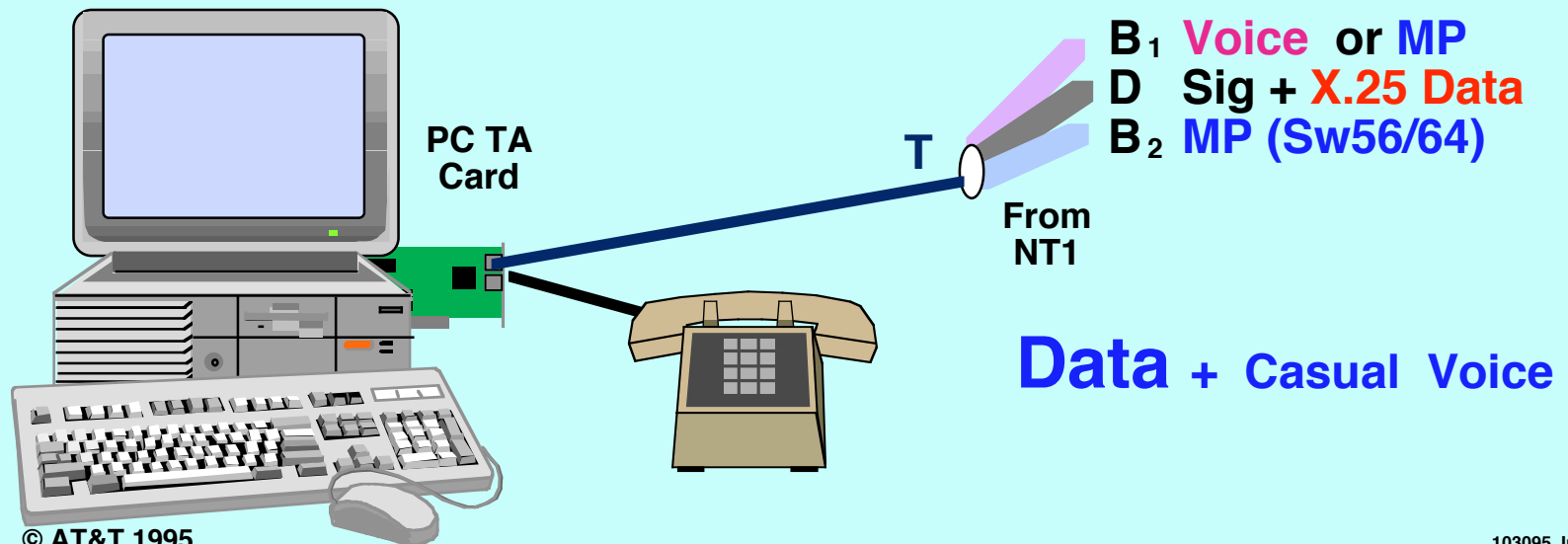
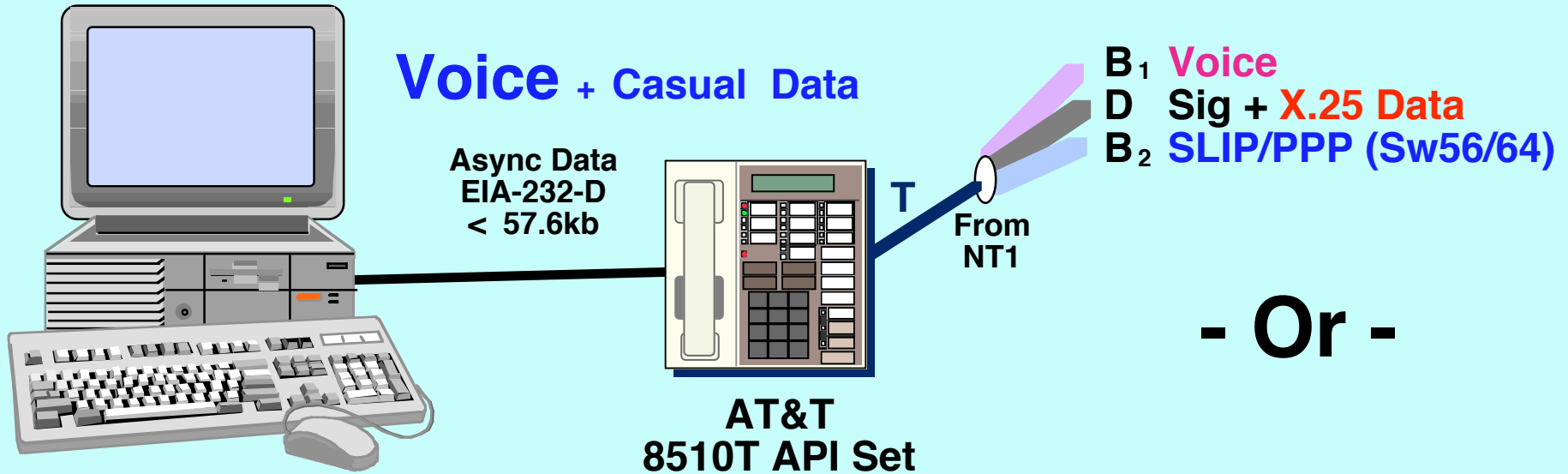
Multiple Channel Calls



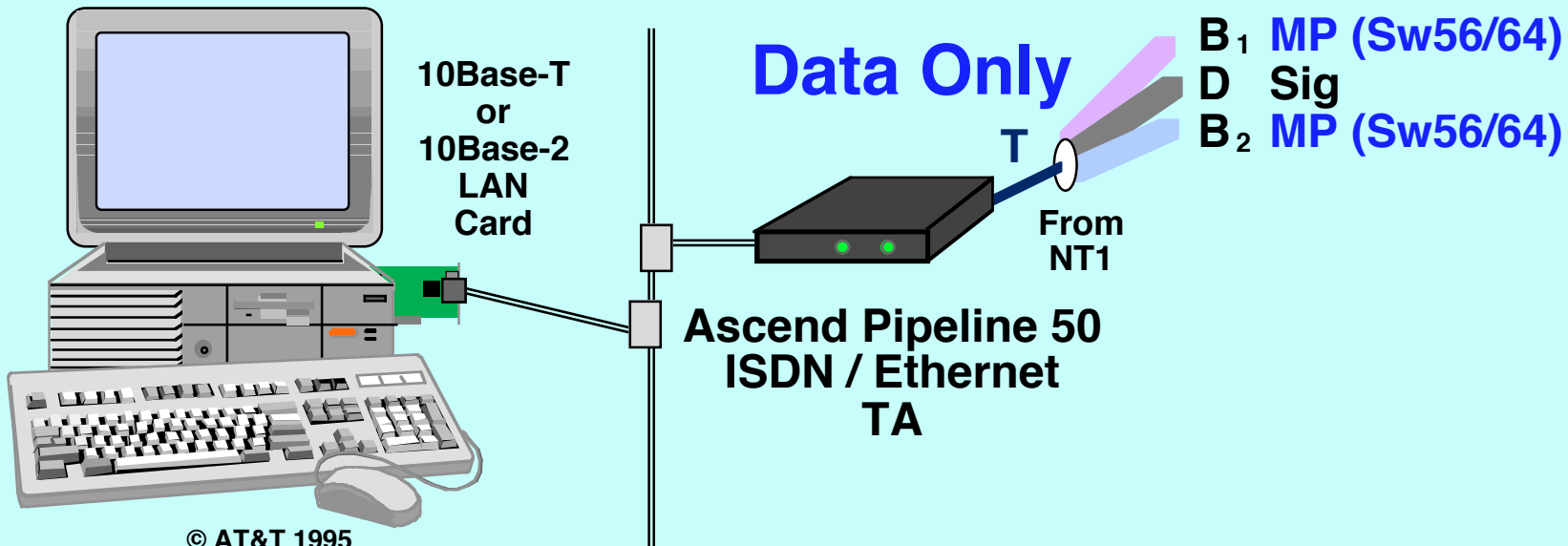
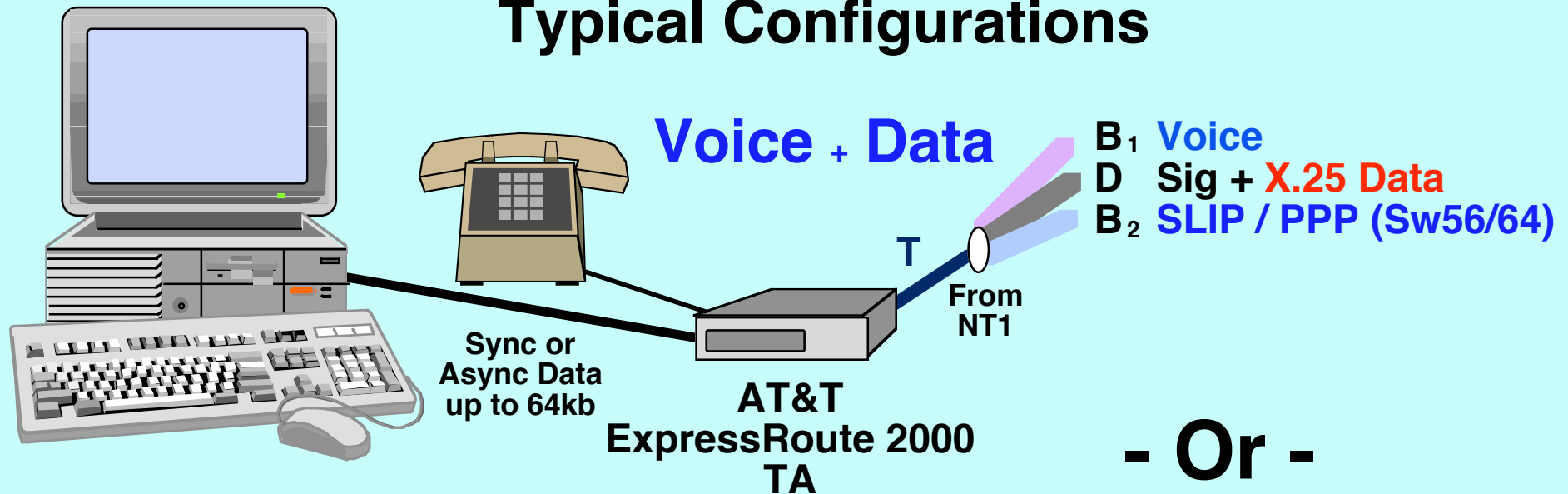
Remote Network Access



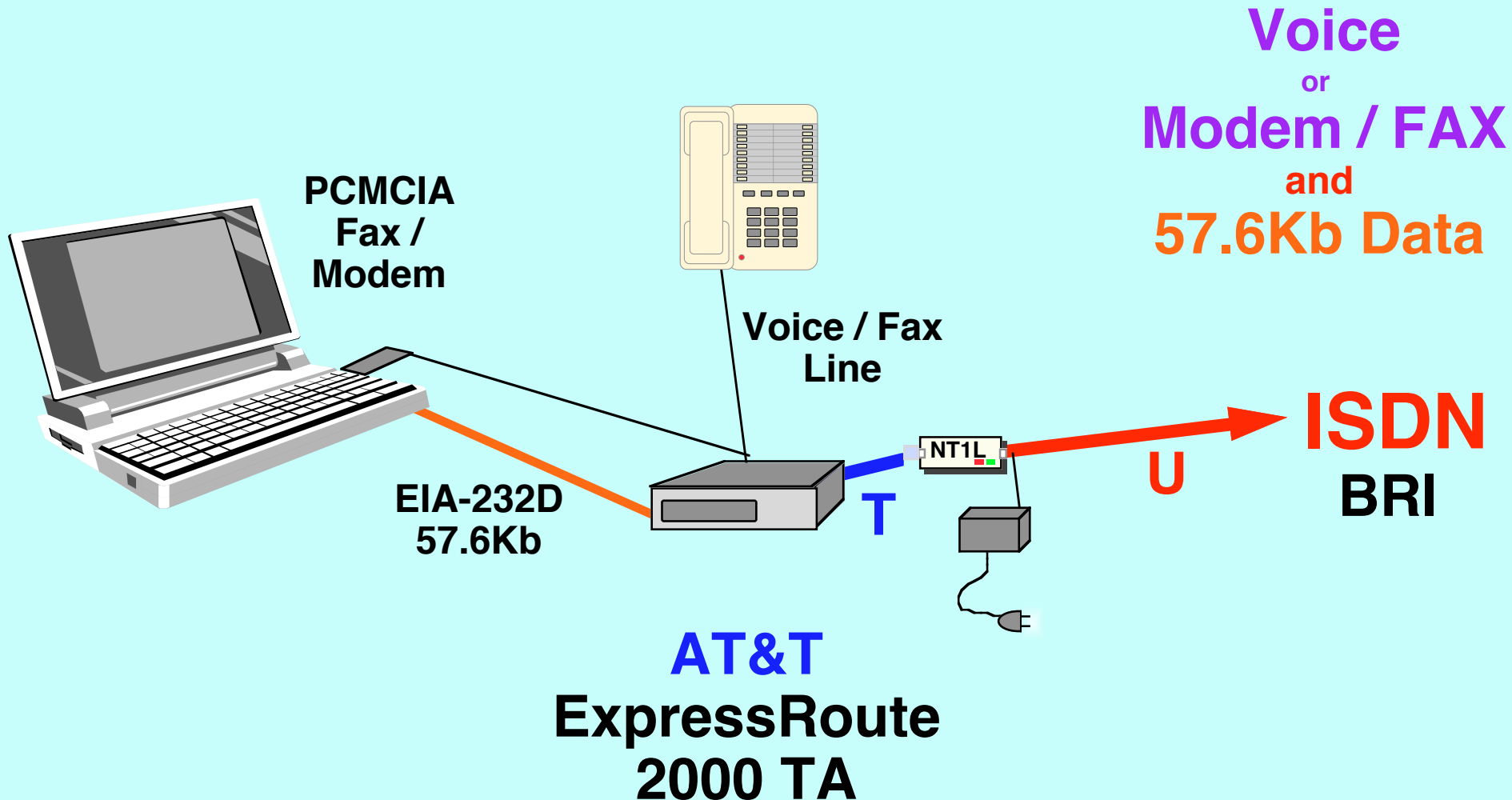
Basic Rate ISDN: Typical Configurations



Basic Rate ISDN: Typical Configurations



Home Office - Laptop

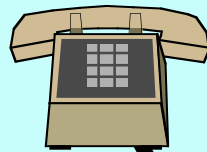


IBM WaveRunner

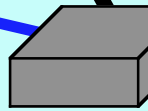
Async, Sync & Modem

WaveRunner

V.120 + Sync Data
+ V.32 DSP Modem



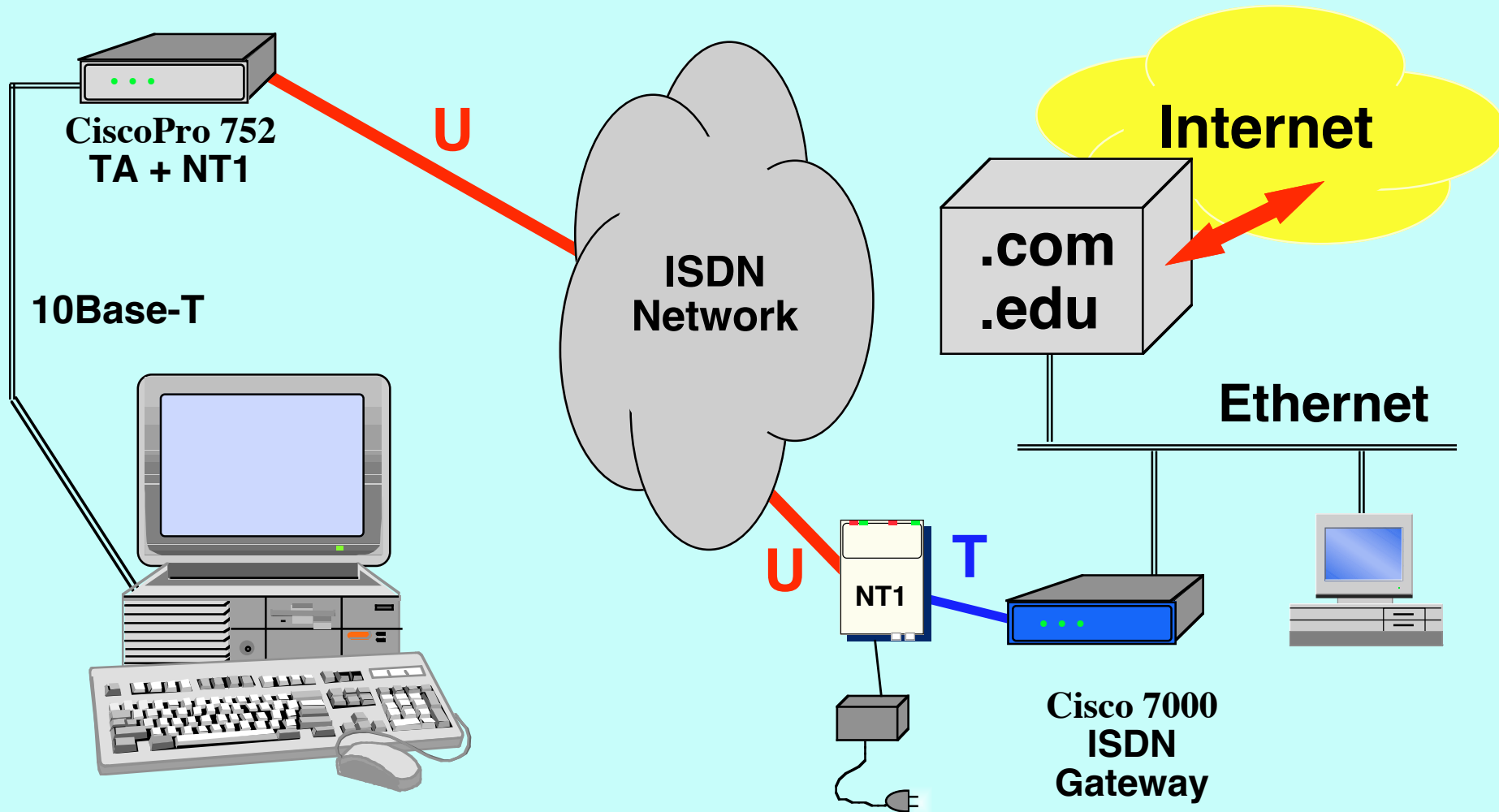
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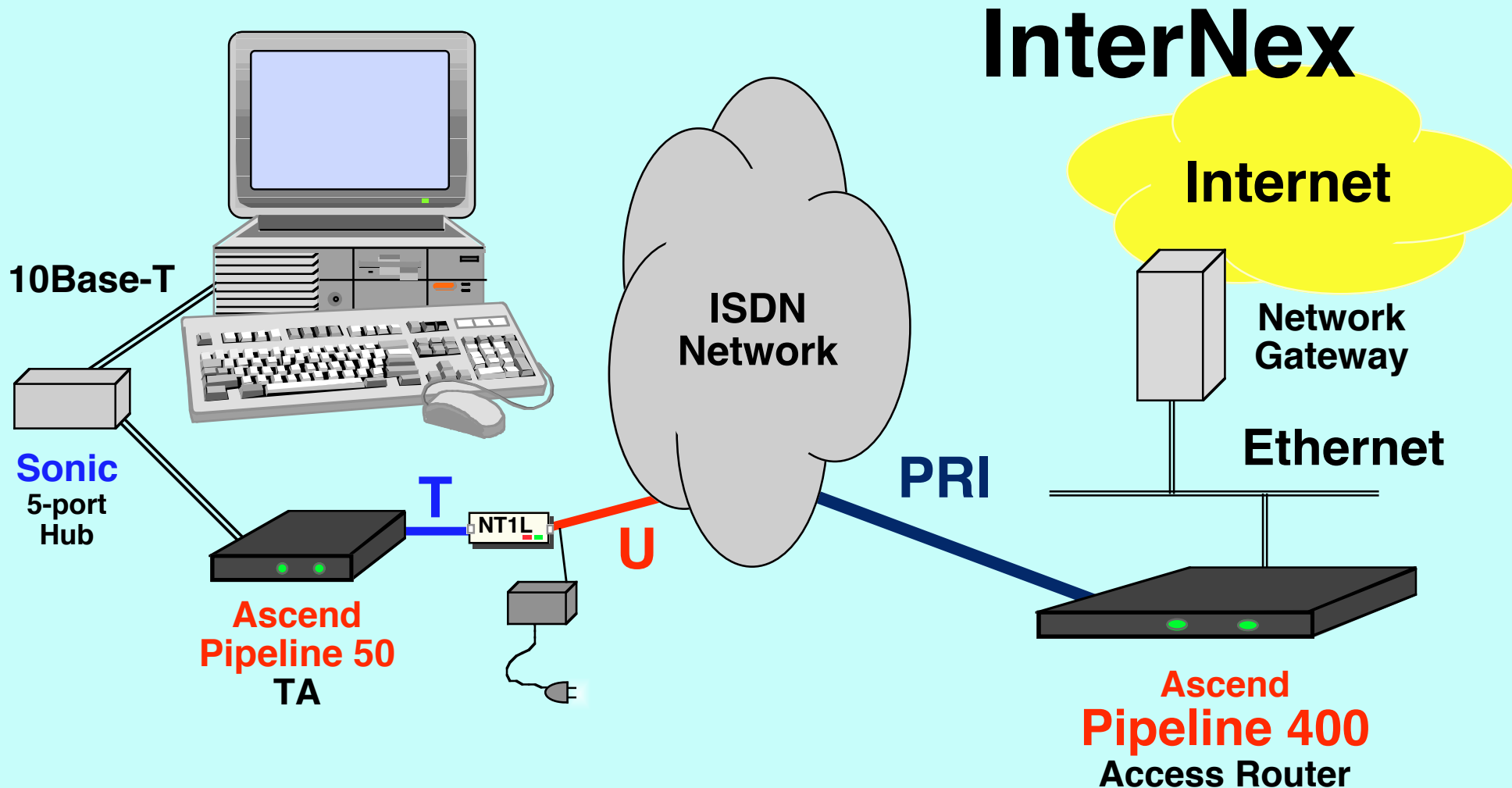
NT1+TA



Corporate / Educational ISDN Access



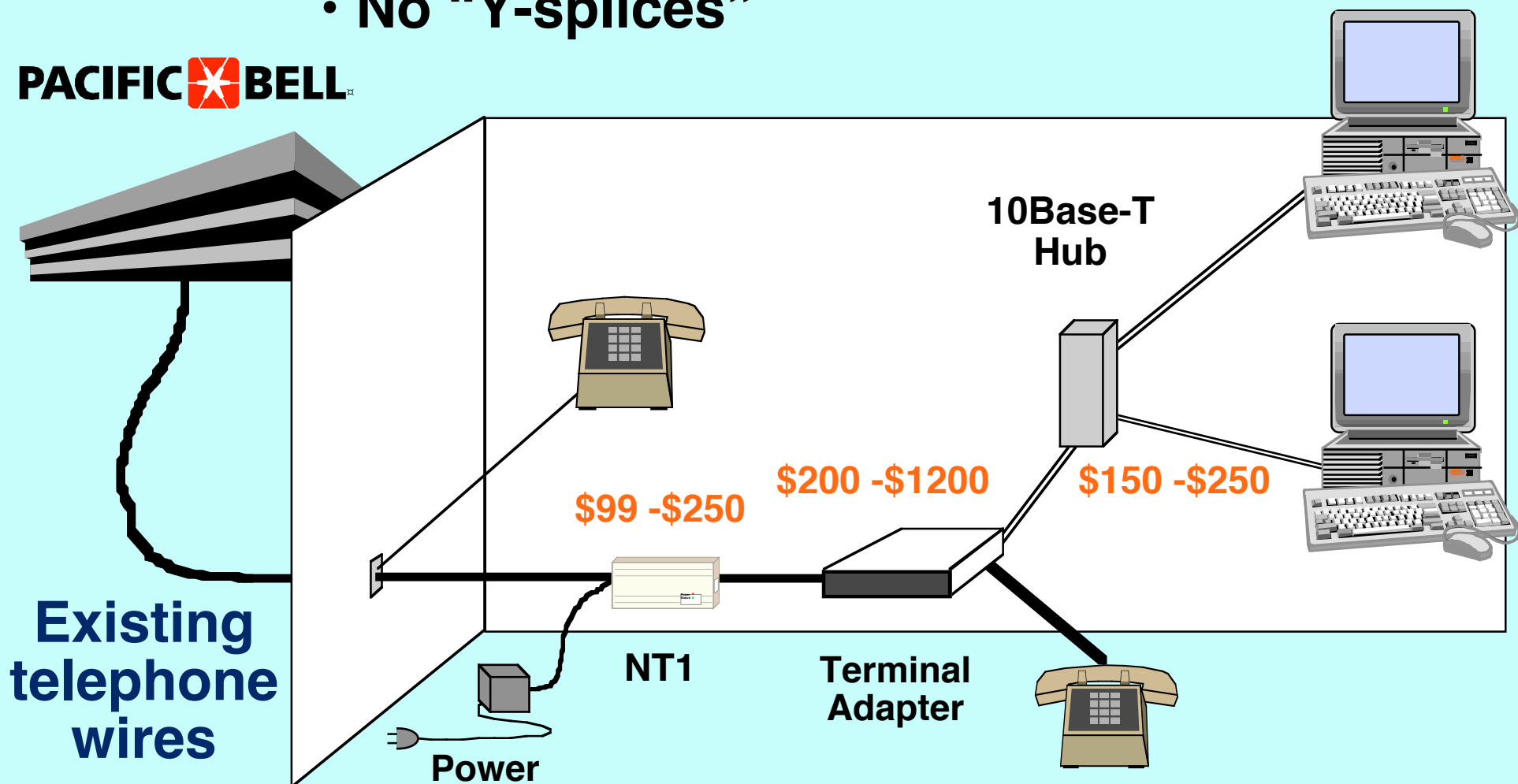
Commercial Internet Access



ISDN Home Wiring

- High Quality Twisted Pair
- Home Run - Star Configuration
- No “Y-splices”

PACIFIC  **BELL**



Starting Points

- **ISDN Equipment**

<http://alumni.caltech.edu/~dank/isdn>

- **Telephone Service Provider**

<http://www.bellcore.com>

- **Internet Access Service Provider**

InterNex, PSInet, CERFnet etc...

ISDN Implementations

Basic Rate Interface:

- **AT&T 5ESS®** - **Custom ISDN**
- **NorTel DMS** - **Pre NI**
- - **All** - **National ISDN 1 (NI-1)**
- - **All** - **National ISDN 2 (NI-2) (NI'95)**

“Must Know” BRI Parameters

- **For the ISDN Line:**
 - Switch Type & Software Release
 - National ISDN (**NI-1, NI-2, NI'95/'96/'97**) or “**Custom**”
 - **ANSI-U 2B1Q** or **T** interface
- **For Each ISDN Device**
 - Primary DN (Directory Number) & any others
 - **SPID- Service Profile Identifier**
 - » Required for Multipoint, for NI, and for some switch types
 - » Uniquely associates Equipment to Bearer Services
 - » SPID may apply per Device or per Bearer Capability
 - Unique **Data**, **Packet**, and **Voice** capabilities per SPID

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MAKING AND ENFORCING ELECTRONIC CONTRACTS

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Brenner, Saltzman & Wallman
New Haven, Connecticut**

I. Introduction

What Kinds of Contracts Are We Talking About?

As commercial use of the Internet, on-line services and electronic messaging systems continues to grow, one can imagine all sorts of business transactions being conducted in cyberspace. To an increasing degree, participants will seek to memorialize these transactions in electronic rather than the traditional paper form. Business people can gain an appreciation for many of the issues likely to be raised in such transactions by examining the application of some of the basic traditional contract principals to five types of electronic transactions: the sale of goods or services effected via Electronic Data Interchange (EDI), the on-line licensing of computer software, the provision of on-line services and the negotiation and making of more complex “negotiated” agreements. Of course, the application of the law of traditional contracts to the world of cyberspace is highly complex and uncertain. This analysis is thus necessarily somewhat oversimplified and should not be viewed as a complete discussion of all of the issues in this detailed and evolving area. Rather, it should be treated as a kind of thumbnail sketch of two principal issues raised by the specific types of transactions discussed.

II. The Basics of Contract Law

A. What is a Contract?

At its simplest, a contract is an agreement between two or more parties that the law will enforce. It is nothing more than a promise or set of promises that the law will recognize. For example, if Bob agrees with Sally that he will sell her his bicycle in exchange for \$100, and Sally agrees that she will give Bob \$100 in exchange for his bicycle, Bob and Sally have entered into a contract. Obviously, contracts can be a lot more complicated than this example, but, at bottom, they are all subject to the same basic set of legal rules. Those rules govern whether or not a contract will be enforced. That is, whether, if one party to the contract breaks his or her promise, the other party can go to court and get a judge to either order the promise breaker to keep the promise or award the aggrieved person damages for breach of the contract.

B. What Legal Rules Govern?

In general, there are two major sources of contract law: the Uniform Commercial Code (or “UCC”) and what is known as the common law. In most states (other than Louisiana), the rules of contracts are governed by the common law. The common law is the judge-made law found in legal cases. The common law of American contracts has been organized and summarized on a couple of occasions since the early part of this century and published in collections of legal rules called Restatements. The most recent Restatement of Contracts was published in 1980. When lawyers discuss general principles of contract law, they are usually talking about the law set forth in that source. Of course, because the common law is generally made by judges, the law as described in the Restatement is in a continuing state of evolution and there are always variations in the rules from state to state.

One important exception to the applicability of the Restatement of Contracts is the UCC. Article 2 of the UCC is a set of legal rules governing the sale of goods. It has been adopted (with some variations) in statutory form in every state except Louisiana. When lawyers discuss the rules of contract law as applied to the sale of goods, they are discussing the UCC (although they may not be discussing specific state variations on the UCC).

C. The Rules Governing Contract Formation: Offer and Acceptance

For a contract to be formed, the parties must reach an agreement to which they “mutually assent.” Lawyers often use the phrase “meeting of the minds” to describe the concept of “mutual assent.” That is, both parties must clearly understand each other and the subject of the agreement for a contract to exist. The process of reaching a “meeting of the minds” is most often arrived at through what are called an “offer” and an “acceptance.” In other words, one party proposes a bargain (this is the “offer”) and the other party agrees to the proposed bargain (this is the “acceptance”). For example, when Bob says to Sally: “Sally, if you give me \$200, I’ll give you this bike,” he has made an offer. When Sally says “you’ve got a deal Bob, I’ll give you \$200 for that bike” Sally has accepted Bob’s offer. Again, this example is very simple, but these same rules govern even the most complex contractual relationships. Put simply, there can be no contract unless there is an offer and an acceptance of that offer communicated to the offeree.

D. Questions Regarding Enforceability: The Statute of Frauds

There are numerous legal rules governing the circumstances under which a validly formed contract can be enforced. For example, most people are familiar with the concept that a contract must be in writing to be enforced. This is not entirely accurate, but it is a subject worth discussing in connection with electronic transactions. The idea that a contract must be in writing derives from something called the “statute of frauds.” The statute of frauds is a catch-all phrase for the ancient legal doctrine that requires most contracts to be both in writing (as opposed to oral) and signed by the parties in order to be enforceable. Modern versions of the statute of frauds are found in both the Restatement of Contracts and the UCC. The most important thing to know about the statute of frauds is that it only applies to some types of contracts, generally, those dealing with land, those dealing with goods priced at \$500 or more, and promises that, by their own terms, cannot be performed within one year. This last category of contracts is the most confusing. A

contract that, in theory, can be completed within one year is not subject to the statute of frauds. Thus, if A contracts with B to build a new Golden Gate Bridge, that contract need not be in writing because, in theory, B could complete the project within one year. However, if A contracts with B to purchase B's entire crop of Christmas trees each December for the next three years, the contract must be written to be enforceable. B cannot perform, by the express terms of the contract, within one year.

Recognizing, then, that not all contracts are subject to the requirements of the statute of frauds, the statute still has relevance for many electronic transactions. In order to understand the Statute of Frauds as it applies to on-line commerce, it is important to understand why the rule exists in the first place and how it is applied in "real world" contracting situations. The justification for the writing requirement is really two-fold. First, by putting at least their basic understandings down on paper, it was thought that the parties to a transaction would be alerted to the document's legal effect and therefore would more carefully craft their expectations yielding a more definite and clear "meeting of the minds." Second, and more importantly, by memorializing their understandings in a writing, the parties leave better evidence for a court to examine in enforcing the parties' agreement. This protects defendants from spurious claims and makes the court's job easier, thereby promoting efficiency in the enforcement of contracts.

The signing requirement has a similar foundation. First, in general, people are thought to more seriously appreciate the legal implications of a document and, as a result, to contemplate its contents if they are required to sign it. Second, it is easier to prove that a person accepted and agreed to the terms of a writing if it was signed by that person.

Finally, one further point bears discussion regarding the statute of frauds: its diminishing significance. Originally, the application of the statute of frauds was quite strict, however, courts and commentators have increasingly moved away from that strict interpretation in an effort to accommodate practical concerns. For example, the statute of frauds does not generally require all of the terms of a contract to be set forth in writing; the writing must only state the essential terms of the agreement. Further, the signature requirement has also been relaxed somewhat so that all that is required is a symbol or other means of authentication which identifies the party against whom the contract is to be enforced. This symbol may be a thumbprint, initials, a rubber stamp or an impression on paper, for example.

In applying the statute of frauds to evolving communications technologies, courts have generally been flexible and sensitive to the realities of business practices. For example, the statute of frauds has not generally been a barrier to the enforceability of contracts entered into via telegraph or telex. In telegraph cases, most courts have been willing to accept the typed paper record of the telegraphed message as sufficient to satisfy the writing requirement and have not been strict in enforcing the signature requirement. In the case of contracts entered into by telex, the paper record has not been an issue (since telex messages are transmitted in text form and automatically printed by the recipient terminal) and the signature requirement has been satisfied by the confirmation codes used in the telex transmission process. In general, a paper writing is no longer required where the parties have intentionally reduced their agreement to "tangible form".

While several cases have noted that contracts were formed via an exchange of faxes, there appears to be no reported case where the issue of the enforceability of a fax contract has been argued and decided. However, in light of the cases regarding telegraphs and telexes, it is unlikely that a court would invalidate a fax contract on statute of fraud grounds. First, the writing requirement is much more easily satisfied in the case of a fax than in the case of a telegraph since a fax is not a transcript but an exact duplicate of a writing created by the sender. Certainly there is a strong argument that the parties have

reduced their agreement to a tangible form. Second, fax signatures should be much more familiar to a court than telex codes as a reliable indication of the senders identity.

III. Electronic Contracts

A. Electronic Data Interchange (EDI).

Electronic Data Interchange, or EDI as it is often known, is one of the dominant uses of computer networking technology for commercial contracting applications today. EDI at its simplest is the movement of electronic messages, such as purchase orders, from one company's computer to another in a manner similar to the transmission of e-mail. The distinguishing characteristic of EDI is that messages are structured and coded in accordance with a standard previously agreed upon by the parties. The real benefit of EDI (and what differentiates it from e-mail) is that EDI messages can be structured so that they can be read and acted upon by the recipient's computer without the necessity of human intervention. This, of course, reduces transaction times and eliminates the risk of human error in the data entry process. EDI is an essential feature of "just in time" manufacturing systems characteristic of the automotive industry.

Of the various types of transactions examined here, EDI presents the fewest questions from the perspective of traditional contract law. One reason for this is that EDI trading partners very often agree in advance on the parameters of their trading relationship by entering into a traditional written agreement. These contracts, often referred to as "trading partner agreements" in EDI parlance, set forth the agreed upon framework for the parties' future electronic transactions such as: the message structure and code, the manner in which trade is to be conducted, the basic terms and conditions of sale, etc. Various legal organizations such as the American Bar Association (the "ABA") have published suggested model trading partner agreements of this sort. Because the parties to EDI transactions generally agree in advance on the ground rules of their contracting relationship, EDI trading often fits quite nicely into the framework of the existing contract rules regarding offer and acceptance. The parties will have agreed in advance on specific methods for communicating purchase orders (i.e., offers to buy goods or services) and for manifesting acceptance of such orders in the trading partner agreement, a traditional paper contract.

The application of the statute of frauds to EDI is perhaps less clear, but it is nonetheless unlikely that a court would refuse to enforce an EDI transaction on this basis. Generally EDI trading partners agree in their trading partner agreement upon certain record retention procedures. Indeed, record retention requirements are found in the ABA model trading partner agreement as well as in most others. This is necessary for practical, as well as legal, reasons. Because EDI transactions are often executed automatically without human intervention, the presence of a record of those transactions is necessary for audit purposes. It is probably the case that the paper printout that could be produced from EDI records would satisfy the statute of frauds requirement that the terms be reduced to a tangible form. The ABA has taken this position with respect to the record-keeping measures recommended in their model agreement. The ABA has also taken the position that EDI could satisfy the signature requirement of the statute of frauds. Because of the computer-to-computer nature of EDI, trading partners will necessarily have already taken steps to ensure message authentication. These authentication measures should qualify as symbols that sufficiently identify the sender of the message for statute of frauds purposes.

B. On-line Software Licensing.

Increasingly, software companies are using on-line registration as a method of entering into license agreements with software purchasers. Presumably, for example, Microsoft Corp. will be using such a mechanism when, as recently announced, it begins distributing its software through resellers over the Internet. This technique presents an alternative for some software makers to traditional “shrink-wrap” licenses. Indeed, an examination of some of the issues that arise with shrink-wrap licenses themselves provides insights into some of the issues arising with on-line licensing.

Historically, shrink-wrap licensing arrangements have been viewed as a practical, but potentially unreliable alternative to entering into written license agreements with software purchasers. Of course, software makers could require purchasers of software to enter into written license agreements at the point of purchase or to sign license agreements enclosed with their purchased software and mail them back to the manufacturer. But, each of these alternatives presents a variety of practical problems. Among such problems, the point of sale strategy is difficult to control since the software maker is usually not the actual seller and the mail-in agreement strategy relies upon the voluntary compliance of the purchaser. Software makers devised the shrink-wrap strategy in an attempt to avoid these and other practical issues.

The shrink-wrap licenses discussed here are those of the type which is printed on or visible from the outside of the package enclosing the floppy disc, CD or other medium on which the software is stored. Typically such packaging is sealed and bears a statement to the effect that by breaking the seal or by using the software, the purchaser has agreed to be bound by the terms of the license agreement. There are two fundamental issues that impact the enforceability of such shrink-wrap licenses, both of which can be seen in terms of our basic discussion of offer and acceptance. First, when the user purchases the software, she has never seen the terms of the license agreement. In such a case, it is not clear how she can be said to have come to a “meeting of the minds” with the software maker regarding such terms. At the time the license terms are made known to the user, she has already performed her end of the bargain in the software sale and for this reason, the user and the maker could never have agreed on the terms of the license at the time of the sale. This would be a little bit like Bob, in the earlier example, agreeing to sell Sally his bike for \$100 and then, after Sally pays him and takes the bike home, calling her and saying: “Oh, by the way, I get to use the bike on Sunday mornings.” At best, the addition of the license terms can be viewed as a later modification of the original contract between the maker and the user regarding the purchase of the software. It is difficult to argue that such terms are a part of the original contract of sale.

Second, the user’s act of accepting the additional terms set forth in the license contract is ambiguous (the breaking of a seal or the installation of the program may not be a clear enough indication of the user’s agreement to be bound by the terms of the license). Such actions are less clear signs of agreement than a signature. The ambiguousness of the purchaser’s assent is an issue of particular concern in the software licensing area. Typically software licenses are designed to do three principal things. First, they are designed to get the purchaser’s agreement not to make unauthorized copies of the software or otherwise violate the manufacturer’s intellectual property rights. As a practical matter, however, the license agreement probably does far less to protect the manufacturer in this area than the copyright law does and that protection is not at all dependent upon a contract between the purchaser and the manufacturer. Second, such contracts often are designed to limit the scope of the warranties made by the software maker regarding the performance of the product. Such warranty limitations are essential to the economic viability of software development since it is so difficult to create a “bug-free” product. Third, software license agreements also contain limitations on the liability

of the software maker for defective products, protecting them against claims for lost profits, for example. This type of limitation is also necessary to preserve the economics of the software development industry. What start-up software maker could survive if it were routinely subject to claims by purchasers of software for compensation for business down-time sparked by bugs in its software? The law, however, makes such limitations of warranty and damages difficult to enforce, especially in the consumer context. Among other things, to be enforceable these provisions must be open and conspicuous so that it is clear the purchaser will notice them. This is a way of assuring that the purchaser has clearly agreed to such terms as a part of the sale contract. The ambiguousness of the purchaser's acceptance of the contract as a whole in the shrink-wrap context may make such provisions that much more difficult to enforce.

The fact that shrink-wrap licenses are accepted via action rather than by a signature also raises statute of frauds concerns, although this may not be a significant issue since the statute of frauds does not generally apply to the sale of goods or services having a price of less than \$500. Generally, sales of more expensive software applications will be handled in traditional written form.

Finally, some have suggested that shrink-wrap licenses may be unenforceable because they are so-called "contracts of adhesion." The term "contract of adhesion" refers to standard printed form contracts which are not subject to any negotiation by the parties. In general there is a trend in consumer-oriented law to refuse to enforce such contracts where the results would be unfair. Accordingly, to the extent that they are unfair, shrink-wrap licenses may not be enforceable.

The on-line registration of software may avoid some, but not all of the uncertainties associated with shrink-wrap licensing depending upon how the transaction is structured. Assuming that the user of the software is merely registering the software on-line (as opposed to purchasing it on-line, as with the Microsoft example), the argument that the user never sees the terms of the license agreement until after the software is purchased is equally applicable in the on-line transaction as in the shrink-wrap context. Assuming, however, that the sale of the software is actually being effected on-line at the time of registration, this argument does not apply and the on-line license would not suffer from this weakness. In such a situation, the prospective purchaser can be afforded the opportunity to read the license agreement prior to paying for it. Thus, when the user pays for the program, she is clearly accepting the terms of the license as well. This argument can be strengthened if the purchaser is required as part of the transaction to signal her affirmative acceptance of the terms of the license by typing, for example, "I accept" at the bottom of the screen displaying the terms. In either case, much of the ambiguity regarding the acceptance of license terms by action rather than a signature present in shrink-wraps can be eliminated via a properly structured on-line transaction. Even where the user does not purchase the software on-line, the registration process can be structured such that the purchaser cannot use the software until the registration process is completed.¹ By keeping an electronic record of the user's registration, the software manufacturer can demonstrate acceptance of the terms of the license agreement more reliably than in the shrink-wrap context. If the sale is also being effected on-line and the user pays for the software, payment itself may be sufficient evidence of acceptance for the license to be enforceable. Again, as with shrink-wrap licenses, to the extent the license agreement contains limitations of warranties or liability, such terms should be

¹ Of course, in such a structure, the purchaser must be given an opportunity to return the software for a full refund if the terms of the license are unacceptable.

open and conspicuous so that the purchaser cannot claim they went unnoticed at the time of the sale.

With respect to the “contract of adhesion” argument, the analysis as applied to on-line licensing (or any other non-negotiated contract, whether electronic or not) is really no different than the garden variety shrink-wrap situation. To the extent that a court perceives a contract as overreaching or unfair in the consumer context, the contract may not be enforceable.

Finally, on-line registration does present one issue not raised by shrink-wrap licensing. No writing setting forth the terms of the license is produced in the on-line transaction. To the extent that the software maker can demonstrate a secure and reliable record retention procedure, it is possible that court would accept the electronic record of the registration process as a writing. However, it is unlikely that the software maker’s record retention system will be as secure as in EDI transactions, where the parties often conduct mutual audits of their records according to pre-agreed procedures and the case for a writing will likely not be as strong in this context. Moreover, in EDI the parties can always point to the traditional paper trading partner agreement as the basis for their bargain. There is no written contract to fall back on in the on-line context. That said, the willingness of courts to rely upon purely electronic records as writings is likely to increase rather than decrease as such records become more the norm rather than the exception.

C. On-line Sale of Goods

The sale of goods via electronic contracts (other than EDI) is also gaining in popularity. Such transaction are really quite similar from the point of view of contract law to the on-line registration of software where the software is also purchased on-line. The terms of purchase can readily be made available to the prospective purchaser before the contract is made and specific assent to such terms could be made a part of the structure of the transaction. In fact, in certain situations, such as the sale of hazardous goods, it may be desirable to structure the transaction such that the purchaser must review and specifically accept at least certain terms (limitations of liability and warranty for example) before the purchase can be consummated. Thus, there can be no argument that terms were added after the contract was made. If payment is made other than via an on-line mechanism, the seller may also wish to include a written copy of the sales terms in the invoice or other request for payment sent to the purchaser via ordinary mail so that when payment is made, there is a strong argument that the purchaser accepted those terms. This mechanism can also solve the statute of frauds problem by providing a traditional paper writing evidencing the terms of the agreement. But, even where payment is made electronically, a copy of the license agreement can be e-mailed to the purchaser and, if the seller keeps a detailed record of the transaction, statute of frauds problems should be no more of an issue than in the on-line registration context.

D. Provision of On-line Services

On-line service providers are moving, and should continue to move, toward using wholly electronic contracts. Those on-line service providers who enter into written agreements with their subscribers often provide pointers in their written agreements to conditions of use policies and other terms of service that appear solely in electronic form. These are not, however, electronic contracts per se and are not the focus of this discussion. Instead, the concern here is with terms of service or conditions of use that are

not backed up by a written agreement. Such electronic transactions are amenable to an analysis similar to that applicable to the on-line registration of software and the on-line purchase of goods. In contracting for services on-line, the prospective purchaser should always be encouraged to review the terms of the service agreement prior to using the services. If the service provider desires, the user can be prevented from accessing the service until she has signaled her acceptance of the terms of the service agreement and this assent can be recorded electronically by the service provider. This arrangement makes it easier to demonstrate that the user actually has accepted to the terms of service. Whether or not to require a user to view and affirmatively signal acceptance of terms of use is a decision that should be based on a balancing of the user's convenience and the service provider's desired level of certainty as to the enforceability of the terms. In a subscriber based service, payment by the subscriber for the services themselves after having had an opportunity to review the terms of service is probably a sufficient indicia of agreement. In an "open" scenario where services are provided free of charge, demonstrating assent may be more difficult (although the necessity of a binding contract with the user may be less significant as well). This situation is a common one on Web sites. So-called "web-wraps" are often employed by businesses establishing web sites for marketing purposes and these sites are generally open for browsing by anyone who accesses them. Some web-site owners attempt to protect their proprietary rights in the web site's content by adding copyright and trademark notices. Others try to limit their liability for such content. In most cases the terms relevant to such purposes however are not presented to users prior to the user accessing the site. Indeed, they are often only accessible by clicking on a link connected to a copyright notice at the very end of the home page (which may consist of several screens of material). Ordinarily, such a notice does not indicate that terms and conditions, including limitations of liability, are accessed via that link. The enforceability of such terms under current law is questionable since users may never see them let alone assent to them. It is particularly suspect where limitations of liability are involved.

Finally, unlike on-line registration, the statute of frauds generally should not be an issue regarding the provision of on-line services since the doctrine is usually not applicable to the simple provision of services.

E. Negotiated Agreements

While EDI, on-line software registration, the on-line purchase of goods and the provision of on-line services are probably the most common types of electronic contracts in use today, any type of contract could, in theory, be entered into on-line. Obviously, however, contracts which are negotiated (that is, which result from a drafting process) present more complicated issues than those which are essentially non-negotiated forms. Because of the back and forth of the negotiating process, it is extremely important that both parties agree, ultimately, on an identical document and that each can demonstrate the other's agreement to that exact document. As with EDI and other types of electronic contracts, this document can be stored in a non-paper form so long as a paper record can be produced and so long as the party seeking to enforce the contract can demonstrate the accuracy of the record. Clearly, encryption technology will be important in facilitating the creation and enforcement of these more complicated agreements on-line.

IV. Emerging Issues

A. Proposed Revision of UCC Article 2:

The National Conference of Commissioners on Uniform State Laws and the American Law Institute, the sponsors of the UCC, have been working on a number of revisions to the UCC, including to Article 2. A main thrust of these revisions is to clarify the UCC as it applies to the sale of intangible property, such as licenses to computer software. Of particular interest in connection with the issues discussed here is the proposed treatment of electronic transactions and of the statute of frauds. The proposed revisions as currently drafted specifically contemplate the enforceability of EDI transactions in particular and of electronic contracts in general. Among other things, the proposed rules would allow a contract to be formed where, after being furnished with an opportunity to review the terms of service, one party manifests acceptance of those terms by accessing or using, for example an on-line service, including, presumably, a web-site. The revisions also explicitly recognize the possibility of electronic signatures. With respect to the statute of frauds, there are competing proposals. The first is that the statute of frauds be deleted altogether and the second is that the writing requirement be carved back to require a writing sufficient only to indicate that a contract has been made which describes the subject matter of such contract. Under the latter proposal, the threshold dollar amount is to be raised to \$1,000.

Of course, it still remains for the draftspersons to settle on a final set of proposed revisions. Moreover, the UCC, as revised, will have no direct authority as a rule of law unless and until it is adopted by the states and, even then, only under the laws of those states that do adopt it. Furthermore, the UCC, as revised, would not necessarily apply to all on-line arrangements, although the sale and licensing of computer software and the furnishing of information stored in electronic media would appear to be within its scope.

B. Digital Signature Legislation

A second emerging topic of interest in connection with the law of electronic contracts is digital signature legislation. Although the statute of frauds may become less of an issue under the proposed revisions to the UCC, it will remain desirable in a variety of contexts, including with respect to contracts not covered by the UCC, if electronic

transactions are considered “signed.” In the last year at least two states, Wyoming and Utah, have enacted specific legislation bearing on this issue. The Wyoming law was specifically designed to make it possible to file documents electronically with the government of that state. Under the new law, the Wyoming secretary of state is empowered to identify a procedure or procedures by which such filings may be authenticated and the choice of that procedure is left undefined. The Wyoming law is significant simply because it adds credence to the general view that digital signature technology is reliable enough to satisfy legal signature requirements. It does not specifically address contracts between private parties. The Utah law, by contrast, applies to a wide variety of electronic contracts and messages, including those with the Utah state government. In its legislation, Utah also adopted a particular digital signature technology(public key encryption) as its choice for authentication. The Utah statute is very significant because it flatly states that a digitally signed document is as valid as if it had been on paper. While there are those who are critical of the Utah legislature’s choice to favor public key encryption over other potential methods of encryption or over other methods of satisfying the signature requirement in electronic commerce, there can be no doubt that the existence of this new law lends further strength to the argument that electronic transactions can be structured so as to satisfy traditional requirements of contract law.

LEGAL ASPECTS OF USING E-MAIL

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Introduction

The use of electronic mail as a routine internal and external communications medium is becoming increasingly common both among lawyers and among business people. The practical advantages of e-mail are obvious, it is in many instances a faster and more effective communications tool than many of the alternatives. E-mail can be sent at any time and, depending upon the configuration of the e-mail system, from virtually anywhere. It does not rely upon the effectiveness of human messengers and doesn't have the space limitations of voice mail. E-mail does, however, bring with it a variety of concerns that are often overlooked by company and law firm managers intrigued by this new and accessible technological "fix." Two such concerns are particularly significant. First, the content of e-mail messages is discoverable in litigation and, second, the use of e-mail can pose issues of security. None of the concerns raised by e-mail, including the discoverability and security issues, however, is so insurmountable as to render e-mail unusable for most purposes and there are some relatively simple and painless ways to overcome each of them.

Use of E-Mail in Litigation

Perhaps the most significant potential issue involving e-mail is one which may go unappreciated by many lawyers and non-lawyers alike: e-mail is "discoverable" in litigation. In other words, e-mail messages, like all other forms of communication, may be used as evidence in a lawsuit both by the author and by the opposing party. Indeed, it would appear that discovery of electronic records, including e-mail, is a current hot topic among litigators. Moreover, e-mail messages need not have been reduced to writing in order to qualify as discoverable documents. The electronic record of the e-mail message itself can be the source of the discoverable material. Indeed, even e-mail messages that were "deleted" by the recipient can, depending upon the configuration of the e-mail system in question, be retrieved from the back-up storage media. This was a relatively well-publicized technique used several years ago by investigators looking into the Iran-Contra matter. However, its use is no longer limited to exotic cases involving issues of national security. Today, such retrieval may be compulsory under court rules governing discovery applicable to ordinary litigants. Certainly this makes e-mail a potentially more significant source of discoverable material than oral communications. Unlike telephone conversations, for example, e-mail, especially where there is an electronic back-up, outlasts the span of human recollection much like paper records do. Because of the retrievability of deleted or erased e-mail messages, e-mail may even outlast its paper counterparts. This is especially true where paper records are subject to a regular document destruction policy (although the creation of paper documentation using electronic means such as word processing and spreadsheet applications, files poses problems with similar to those relating to e-mail in terms of retrievability of back-ups).

While discoverability of e-mail in litigation is not a unique aspect of this communications medium, the fact that e-mail is subject to compulsory production in a

lawsuit may, and perhaps should, affect the way in which businesses make use of e-mail. Because of its accessibility and ease of use, e-mail seems to users like a less formal means of communication than traditional written documents. Users tend to treat e-mail much more like the telephone than the typewriter. Thus, e-mail messages are very often far less formal than written communication ever would be. One writer has even likened e-mail to the 90's version of the office water cooler(a lively forum for all manner of office socializing.

While this fact in and of itself is not necessarily a bad thing(informal communication is often appropriate and efficient(users of e-mail should bear in mind that their messages could one day be subject to public view and interpretation in a court of law. Failing to appreciate this aspect of e-mail could have results which are at best embarrassing and at worst potentially harmful to a company. One anecdote that appeared in the New York Law Journal serves to prove this point. According to this account, e-mail messages were used as evidence in a \$150 million securities fraud lawsuit brought by Siemens Corp. against the Atlantic Ritchfield Corporation ("ARCO") arising out of the purchase by Siemens of an ARCO subsidiary. E-mail apparently retrieved from the ARCO subsidiary computer system purported to show that employees of the subsidiary were aware of significant problems with one of that company's principal products which were not disclosed to Siemens at the time of the sale. One of the messages allegedly authored by an ARCO official at the time of the transaction reportedly states that "the whole basis of our plan is almost invalid due to the fact that we have been operating under the wrong assumptions for 10 years." Needless to say, a message such as this could prove highly damaging in litigation, as could many messages that crop up in the virtual water cooler scenario. Office gossip can be fertile ground for employment lawyers, for example, bringing discrimination, harassment or wrongful discharge claims.

Security

The second significant issue regarding the use of e-mail is security. E-mail, like other communications media, is often used by businesses to transmit messages containing sensitive or confidential information. The disclosure of some of such information, for example, trade secrets or other confidential or proprietary information, could be embarrassing or harmful to a business. The failure to take proper precautions against the disclosure of trade secrets alone can jeopardize their status as such. Many users, however, fail to appreciate the potential security risks associated with the use of e-mail. Depending upon the type of e-mail system used, users of e-mail are subject to varying degrees of risk that the content of such messages could be intercepted by unauthorized third parties without the knowledge of either the sender or the recipient.

Before discussing the risks posed by different e-mail systems, however, one important aspect of the security of e-mail bears mentioning: the Electronic Communications Privacy Act of 1986 or "ECPA", a federal statute codified at 18 U.S.C. §2510 et seq. The ECPA is the principal law governing eavesdropping, wiretapping or other interceptions of communications. While the ECPA is a complex and wide-ranging statute, of particular importance here are some aspects of its treatment of e-mail. The ECPA regulates access to and the interception of electronic communications, including e-mail, making it a crime (and, in most cases, a felony), to do any of the following:

to intercept an electronic communication;

to disclose or use the contents of an electronic communication which you know have reason to know was unlawfully intercepted; or
to access, without authorization, an electronic communications facility; or
to intentionally breach an authorization to access an electronic communications facility and to thereby obtain unauthorized access to electronic communications

These restrictions are subject to a number of exceptions, including provisions for access by law enforcement officials and, under certain circumstances, by the provider of the communications service and for e-mail messages that are readily accessible to the general public, such as postings to computer bulletin board systems. Access and disclosure is also allowed with the consent of the sender or the recipient. By making the interception and use of e-mail a crime, the ECPA was intended to provide a measure of privacy to the users of e-mail and to promote its use as a communications medium. The effects of the ECPA on the security of e-mail are difficult to gauge, however, at least in part because unauthorized access to electronic communications can be difficult to detect. Moreover, the fact that eavesdropping on e-mail is illegal does not necessarily mean that such eavesdropping does not occur.

There are numerous systems available for conducting e-mail communications, including direct modem-to-modem links; in-house routing systems, servers and bulletin boards; third-party services such as America On-Line, CompuServe or MCI Mail; and the Internet. Each presents varying degrees of security. With modem-to-modem links and in-house systems, users control the security of their own communication system and are free to implement whatever controls they feel are appropriate. In general, these systems can be configured to offer a high degree of security. For most users of e-mail, however, particularly those exchanging messages with third parties, such as customers or suppliers, e-mail communications are handled either by a third-party service or over the Internet.

Of the latter two, third-party services offer the highest degree of security. First, the ECPA does not restrict a service provider or its employees from accessing and disclosing messages with the consent of either the sender or the recipient. Some service providers include such a consent in their subscription agreement or terms of service. Businesses making use of such services should review their agreements and may wish to negotiate to have such a provision removed. They may also wish to consult with prospective recipients of their e-mail, at least where it is anticipated that confidential material will comprise a large volume of the messages to such a recipient or where particularly sensitive information may be involved. Even where consent has not been obtained, the primary threat to the security of e-mail sent over third-party services (other than the misappropriation of the user's password and ID number, a risk shared in common with most other e-mail messaging systems) is access to such messages by employees of the service provider where consent is not required. Under the ECPA, a service provider may lawfully access "stored" communications, for example e-mail messages that are in a user's mailbox awaiting delivery, at any time and without notice to either the sender or the recipient. Disclosure of such communications, as opposed to access, however, is only lawful in three principal situations: first, where the user has consented to such disclosure; second, at the insistence of law enforcement authorities; and third, if the service provider believes the communications pertain to the commission of a crime. Thus, absent consent, in most situations even if the service provider does access a company's e-mail, it may not lawfully disclose its contents. As a practical matter, most of the major third-party services claim, contractually or otherwise, not to

allow their employees to access the private e-mail of their users (other than in situations where issues of system security or unlawful activity are involved) and the use of a well-known and established provider should suffice to allay concerns of service party employee eavesdropping. This is especially true if the service provider represents to the user in its terms of service or otherwise that it will not access user's stored e-mail.

While use of the Internet for e-mail purposes is subject to the same risks as those posed by third-party services, it is subject to one additional risk not shared with other systems. Because e-mail sent over the Internet is often routed through a series of computer systems as it makes its way to the recipient and because the sender has no real control over the route the message takes, e-mail messages sent over the Internet are subject to a greater risk of interception. Unfortunately, the sender of e-mail over the Internet cannot satisfy its security concerns simply by investigating its Internet access provider and assessing the provider's reliability. While the provider's system may be secure and its personnel reliable, the sender's mail will pass through any number of unknown and unknowable organizations' systems before it reaches its intended destination. Of course, in most instances, interception of such a message would violate the ECPA, but since such interceptions are difficult to detect, it is not clear how much of a deterrent the ECPA presents. Moreover, there is some potential for interception and disclosure of the user's message where such conduct would not violate the ECPA since that statute does not apply to inadvertent or unintentional actions. Finally, if the e-mail message is sent abroad, the ECPA will offer no protection since that statute's scope is limited to conduct within the United States. Thus, the use of the Internet for e-mail presents the greatest security risk of all of the messaging system options.

Other Concerns Involving E-Mail

Although the potential discoverability of electronic messages and risks of security breaches are two of the most significant issues raised by e-mail, there are a number of other concerns which bear mentioning here. One such concern is sexual harassment conducted over e-mail. In one reported account, an employee was said to have sent a co-worker some 67 sexually explicit messages and propositions over the company e-mail system during a ten-day period. Although sexually harassing messages could be communicated via traditional non-electronic means, it is arguable that e-mail facilitated the communication of such a large volume of messages in such a short period of time without attracting attention from supervisors and co-workers. Perhaps a more significant threat than one-on-one harassment, though, is the ability of a single employee to harass a large number of victims with a single message. One instance of this conduct reportedly occurred when a large number of employees of Chevron were sent pornographic material via e-mail by another Chevron employee. The employees attempted to bring a class action lawsuit alleging sexual harassment. Chevron reportedly settled the suit for upwards of \$2 million.

Another concern is the posting of e-mail on Internet newsgroups. Such postings may bear a company return address or other indicia of their origin that suggest the content of the posting is endorsed in one way or another by the company. Obviously, organizations will want to control the content of whatever public statements they make, whether posted to a newsgroup or disseminated through any other media and managers should be concerned about the possibility of employees making or appearing to make unauthorized statements in this manner.

A third source of concern is the dissemination of copyrighted material via the company's e-mail system. If the organization has Internet access, this issue may be further complicated by an employee downloading proprietary material using the company's computer system. In such cases, businesses face the prospect of vicarious or even contributory liability under the copyright laws. While the law is in a state of flux in this area, the potential exposure could be quite significant.

Finally, companies may be concerned that their e-mail systems will be used for the theft of trade secrets. One well-publicized pair of cases illustrating this issue is currently making its way through the state of California legal system. The cases, one civil and one criminal, involve a former employee of Borland International Co. who, prior to joining Symantec Corp., allegedly communicated trade secrets belonging to Borland to Symantec's CEO.

Formulating an E-mail Policy

The potential for e-mail to be used in litigation, the potential for the interception and disclosure of e-mail messages and the variety of other concerns raised here, while serious issues, need not deter companies from making use of this efficient tool for communication. Rather, once these potential issues are appreciated, measures can be taken to minimize the likelihood of future problems in these areas. Such measures can take the form of an enterprise-wide e-mail policy. Some of the features of such a policy are set forth below:

Emphasize to all users that the company's e-mail system is the property of the company and that it is intended solely for the purpose of carrying on company business.

Personal messages on the company e-mail system are among the most likely to contain informal remarks that could prove damaging if produced in litigation. Company gossip, for example, could be introduced in the context of a lawsuit over the termination of an employee. Avoid this problem by discouraging the use of the system for such purposes.

Advise users that all e-mail messages should be business-like and professional. Although they need not be as formal as written letters or memoranda, users should refrain from using inappropriate, vulgar, profane or harassing language.

The purpose of this guideline is to formalize somewhat the content of the user's messages without rendering e-mail the functional equivalent of formal written communication. While ease of use and speed may be among e-mail's greatest strengths, highly informal messages can be damaging.

Incorporate the company's e-mail system into its ordinary record retention procedures so that e-mail is archived and/or destroyed in a systematic manner. Measures may also need to be taken to prevent deleted or erased e-mail from lingering on the computer system or back-up storage media.

A company should know, as with paper records, which electronic messages it has retained and which it has not. This facilitates the orderly production of and analysis of material in preparation for litigation and can help to avoid the potentially damaging discovery of previously unknown evidence in the course of litigation.

Incorporate the Company's use of e-mail into its overall policies regarding the treatment of confidential information. Users should be made aware that information transmitted via e-mail may be subject to security risks and that security measure may be appropriate in some cases.

Users should be told not to leave e-mail messages on their screens when their desk is unattended and to change their passwords regularly to avoid unauthorized access. Moreover, the use of encryption technology may be advisable if there will be extensive use of e-mail, especially over the Internet, containing trade secrets or other sensitive information.

Particularly if you have Internet access, advise users that the e-mail system should not be used for the uploading, downloading or printing of copyrighted materials (including software) in violation of the copyright laws.

This guideline can help to insulate companies from the allegation that they willingly or knowingly facilitated a violation of the copyright laws.

Once an e-mail policy is formulated, it must be clearly communicated to users of the e-mail system in advance of the users engaging in e-mail communication. Businesses may wish to incorporate the policy into existing employee manuals or may wish to have users sign a receipt indicating their acknowledgment and agreement to its terms. The utility of having such a policy is seriously undermined if users are unfamiliar with its terms or worse—unaware of its existence. Text notes appearing on the access screen to the e-mail system itself referring to the policy may be a useful way to remind users that their access to, and use of, the system is subject to a specific set of rules. A well formulated e-mail policy incorporating the above guidelines which is clearly communicated to users in advance should assist companies to avoid some of the areas of concern associated with the use of e-mail.

Of course, even the most well-drafted e-mail policy, like the ECPA, cannot shield e-mail users from all potential pitfalls associated with this new communications medium, but they can help prevent such problems from arising.

Monitoring User's E-Mail

The question of whether to monitor user's e-mail naturally flows from an appreciation of some of the risks associated with the use of e-mail and the process of

formulating a company policy regarding such use. Whether or not e-mail is to be monitored at all is a complicated issue of company policy that calls for a careful balancing of a variety of interests and considerations. Indeed, the propriety of employer monitoring of e-mail is a hotly debated topic within the business, legal and political communities and companies have adopted a wide range of positions on this issue. Some have opted for a policy stating that user's e-mail will be subject to regular monitoring in the ordinary course of business. Others have opted not to regularly monitor messages, except in response to legal process, obligations to third parties or as a part of a specific investigation. One point on which there appears to be near universal agreement among commentators, however, is that businesses should both make an affirmative decision on what their policy is regarding the monitoring of employee e-mail and they should clearly communicate it to their employees. Failure to do so may leave users of the system with incorrect impressions of the degree of privacy they enjoy in their e-mail communications and such incorrect impressions could expose the business and its managers to potential claims based on an invasion of privacy in the event e-mail is accessed without prior notice.

In making a determination whether to monitor user e-mail as a matter of policy, employers need to know the scope of their right to access such communications under current law. Unfortunately, the law in this area, like many others involving cyberspace, is in a state of flux. Accordingly, while some general guidance can be given on this subject, companies are urged to consult with legal counsel prior to establishing a policy and to keep abreast of developments which may affect the policy they have ultimately settled upon.

The starting point for any analysis of the legality of accessing user e-mail in the employer-employee context is the ECPA. In general, the ECPA does not prohibit employers from accessing employee e-mail. There are four specific justifications for this view which may be relied upon by the employer. First, the employer may have the consent of the employee (the ECPA does not place any restrictions on access to, and dissemination of, electronic communications with consent. Consent of the employee could either be in the form of an express written consent form signed by the employee (for example, where such consent is part of the company's e-mail policy signed by all users) or it could, arguably, be implied if employer access to the employee's e-mail is a condition of the employee's continued employment. Obviously implied consent is a less certain position to rely upon. Second, businesses who operate the e-mail systems used by their employees (as opposed to using third-party providers such as CompuServe or MCI Mail) may rely on the exceptions found in the ECPA applicable to service providers. In general, this would allow companies to freely access all "stored" communications such as e-mail residing in employee's mailboxes. A third basis for employer access is the so-called "business-extension exception." The ECPA does not regulate the interception of electronic communications using devices furnished by the employer and used in the ordinary course of business, such as telephone calls to an employee's office extension. This exception may also extend to communications to and from the employee's desktop computer, such as e-mail, however, the parameters of the "business-extension exception" are, as yet, quite uncertain and employers should use caution in relying on this ground for the wholesale monitoring of employee e-mail. Moreover, this exception would not extend to e-mail messages sent from an employee's home computer (at least where that computer was not provided by the company). A final ground is the fact that, at bottom, a business has the right to access data which is, by definition, its property. This would include all business correspondence and files created by an employee in the course of her duties. Where electronic communications consist of information which is proprietary to the employer, the employer probably has the right to access such communications. This

determination, however, calls for a case-by-case determination and thus may be undesirable as a basis for an employee e-mail monitoring policy. In general, employers will be able to rely upon at least one of these four grounds to support their right to access employee e-mail without liability under the ECPA. Aside from the ECPA, there appears to be no other federal law that would bar companies from monitoring employee e-mail. Although there have been some recent efforts at introducing federal legislation aimed at reducing such access, these do not appear to be gaining momentum in light of the new Republican majority in Congress.¹

There are some state laws, however, that may create privacy rights in employee's e-mail which may restrict an employer from monitoring such communications. These laws include state wiretapping statutes which may be more restrictive regarding the interception of electronic communication than the ECPA. They also include state tort law which may allow for a claim based upon the common law actions of intrusion from seclusion or publication of private facts (two traditional bases for claims of invasion of privacy). The application of state law to this area is uncertain for a variety of reasons. Tort law claims for invasion of privacy, for example, generally require the plaintiff to establish as part of her legal case that she had a reasonable expectation of privacy in the matter disclosed. If an employer has adequately informed its employees of its policy of monitoring e-mail, it may be able to defeat such a claim on this basis. If an employee has expressly consented to such monitoring, the argument for an expectation of privacy in such messages should be weak. Moreover, it is arguable that state law statutes and common law claims in this area are preempted by federal law in the form of the ECPA. Further, the application of state law in some instances may raise complex questions of jurisdiction where the message sender, the intended recipient, the message router and the employer may be located in multiple states. Finally, there is significant variation in the law from one state to another. Accordingly, issues of state law should be carefully reviewed with the assistance of legal counsel before a user monitoring policy is implemented.

Addendum: Some E-Mail Issues for Lawyers

The security issues surrounding e-mail pose special issues for lawyers who make use of this communications tool. Under both the Model Rules of Professional Conduct (see Rule 1.6)) and the Model Code of Professional Responsibility (see Canon 4), an attorney has a professional responsibility to preserve information communicated to the attorney by the client in the course of legal representation. Given that attorney communications containing client confidences carried out over e-mail are subject to a risk of interception and disclosure, it is not inconceivable that the use of un-encrypted e-mail for such purposes could be viewed as an impermissible breach of the attorney's ethical duties. Indeed, similar issues have been raised about the use by lawyers of cellular and cordless telephones, and at least one bar group, the Committee on Professional and Judicial Ethics of The Association of the Bar of the City of New York, has recommended that lawyers exercise caution when making use of such communications media. In this connection it should be noted that cellular telephone communications and the radio

¹ One such statute, The Privacy for Consumers and Workers Act, sponsored by Senator Paul Simon of Illinois, has reportedly been withdrawn from consideration at this time. Simon has announced that he will not be seeking re-election to the Senate when his term expires in 1996.

portion of cordless telephone transmissions are also protected from interception and disclosure under the ECPA. In other words, notwithstanding the fact that it is unlawful to eavesdrop on attorney communications made over cellular and cordless telephones, an attorney may be subject to allegations of unprofessional conduct based upon his or her use of such devices.

The potential for interception and disclosure of e-mail also raises questions regarding the attorney-client privilege, a rule of evidence which cloaks communications between an attorney and her client in which one has a reasonable expectation of privacy. The presence of third parties who may overhear the communications ordinarily is sufficient to defeat the privilege. Again, in the cellular and cordless telephone area, some courts have held that no reasonable expectation of privacy exists in such communications due to their susceptibility to interception, while the state of California recently amended its code of evidence to provide that attorney client communication is not deemed lacking in confidentiality solely because such communication was conducted over a cellular or cordless telephone. Obviously, the law on this question, even as regards cellular phones, is unsettled. Based on these developments, however, it is at least arguable that attorney client e-mail communications, especially where they are not encrypted, are not protected by the attorney client privilege. The argument, of course, is even stronger if those communications are un-encrypted, since encryption lowers the risk of interception and thereby makes it more likely that legally recognized privacy interests exist in such communications.

Accordingly, it may be incumbent upon attorneys communicating client confidences via e-mail to take advantage of readily available encryption technologies. The failure to do so could be deemed a waiver of the attorney client privilege or it could form the basis of allegations of professional misconduct. At the very least, un-encrypted communication should be limited to less sensitive matters.

Finally, as a closing comment in this area, it should be noted that lawyers are not unique in that they are subject to a professional duty to maintain information confidential. Medical professionals, such as doctors and therapists, and financial professionals, such as accountants, are subject to similar restrictions and may be subject to similar legal exposure in the event of inappropriate disclosure of confidential information. It may also be advisable for such professionals to avail themselves of encryption technology to avoid potential allegations of misconduct.

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Information Commerce

n Digital Content, PLUS:

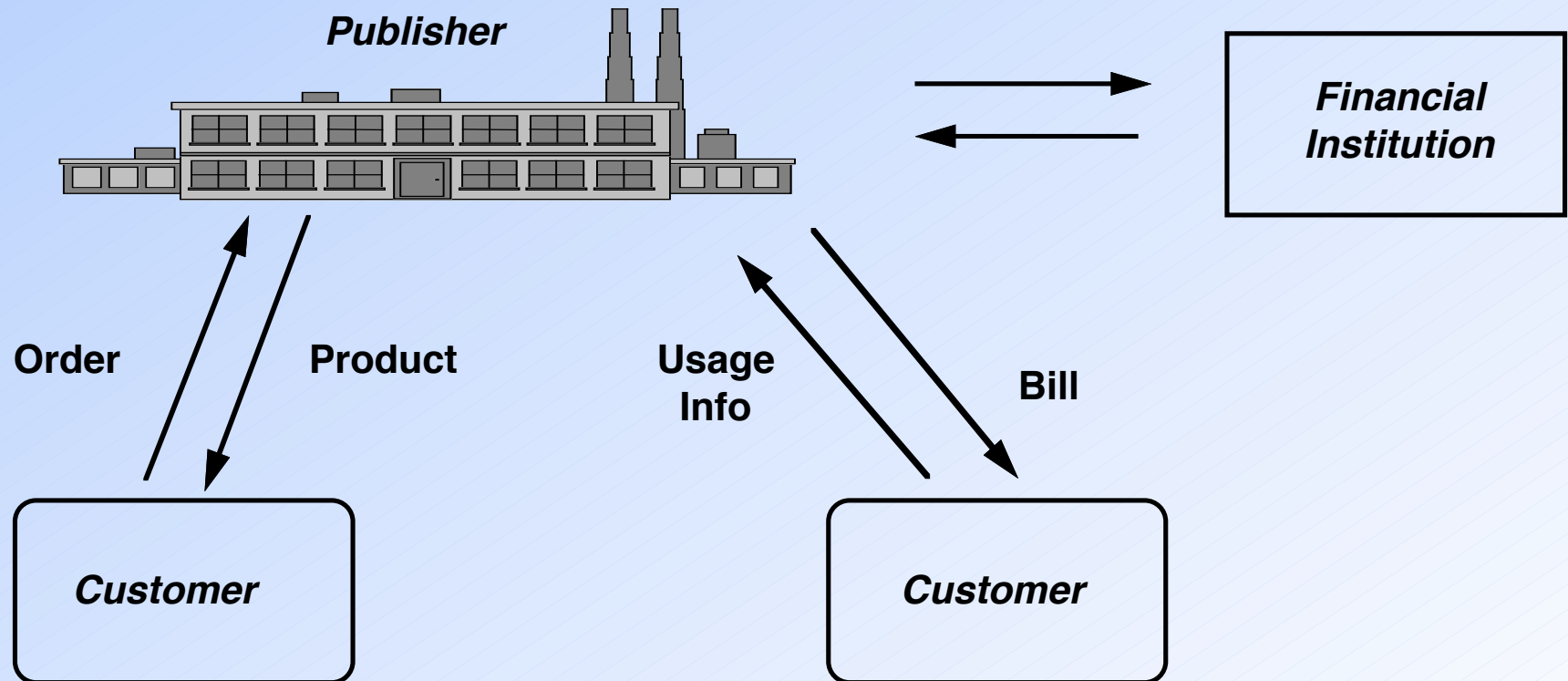
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- Getting Paid - Efficiently - for Micro-Transactions
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All Transactions and Control go through Central Publishers, Clearinghouses, Financial Institutions - Information Moves Physically



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- Secures the Transmission of Content to User and Payments, Information back to Clearinghouse
- Content and Information are “Released” into the Clear at Both Ends, Leaving Rightsholders and Users Unprotected

Today's Protection Models, cont.

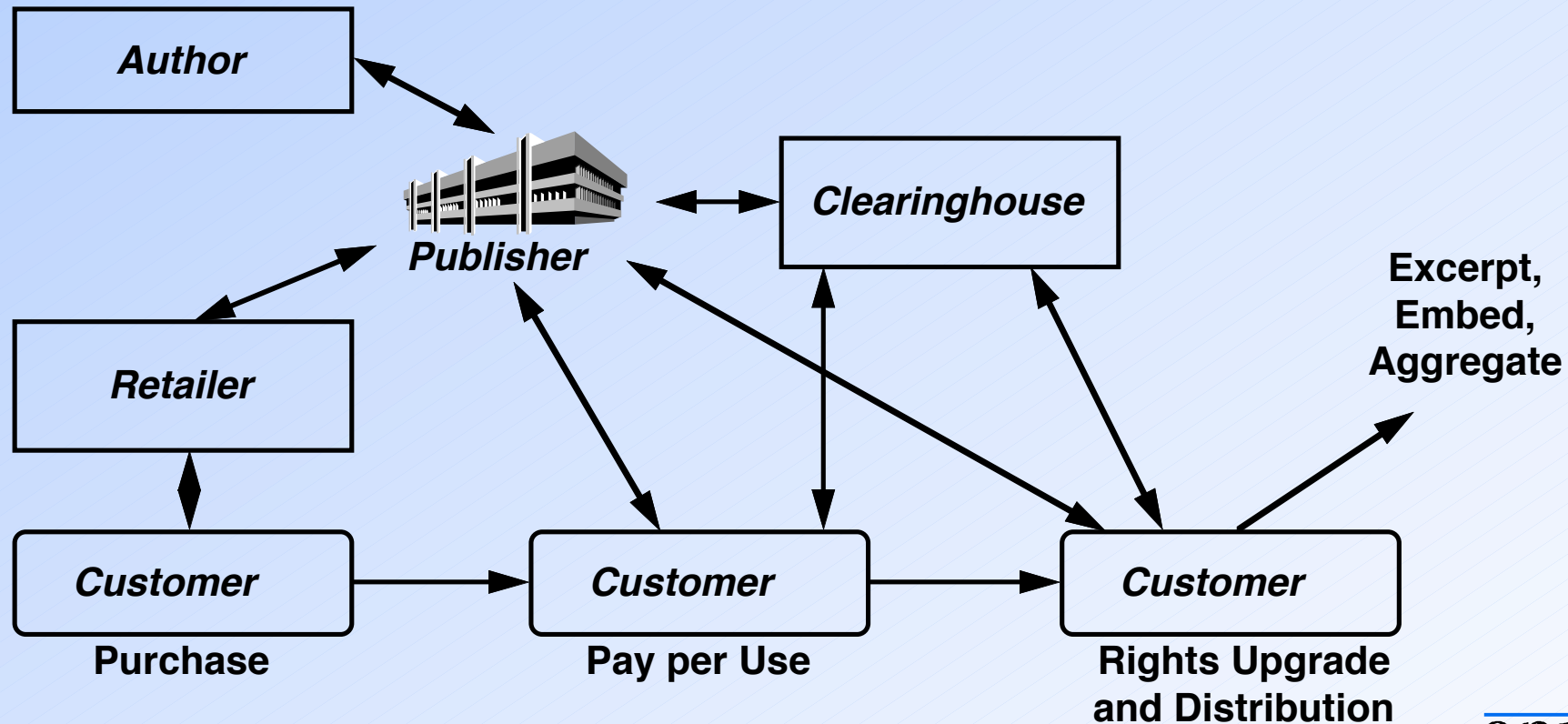
n Early Metering

- Wave, InfoSafe, CD-MAX
- Provide for Limited Pay-By-Use and Usage Data
- Typically Require Hardware-based Security
- Specific Clearinghouse and Business Model Topologies

n No General-Purpose, Multi-Party Value Chains

New Electronic Publishing Model

Direct and Value Chains for Delivery of Products, Including Customer to Customer; Secure Preservation/Transmission of Usage, Rights, Billing



Electronic Information Commerce

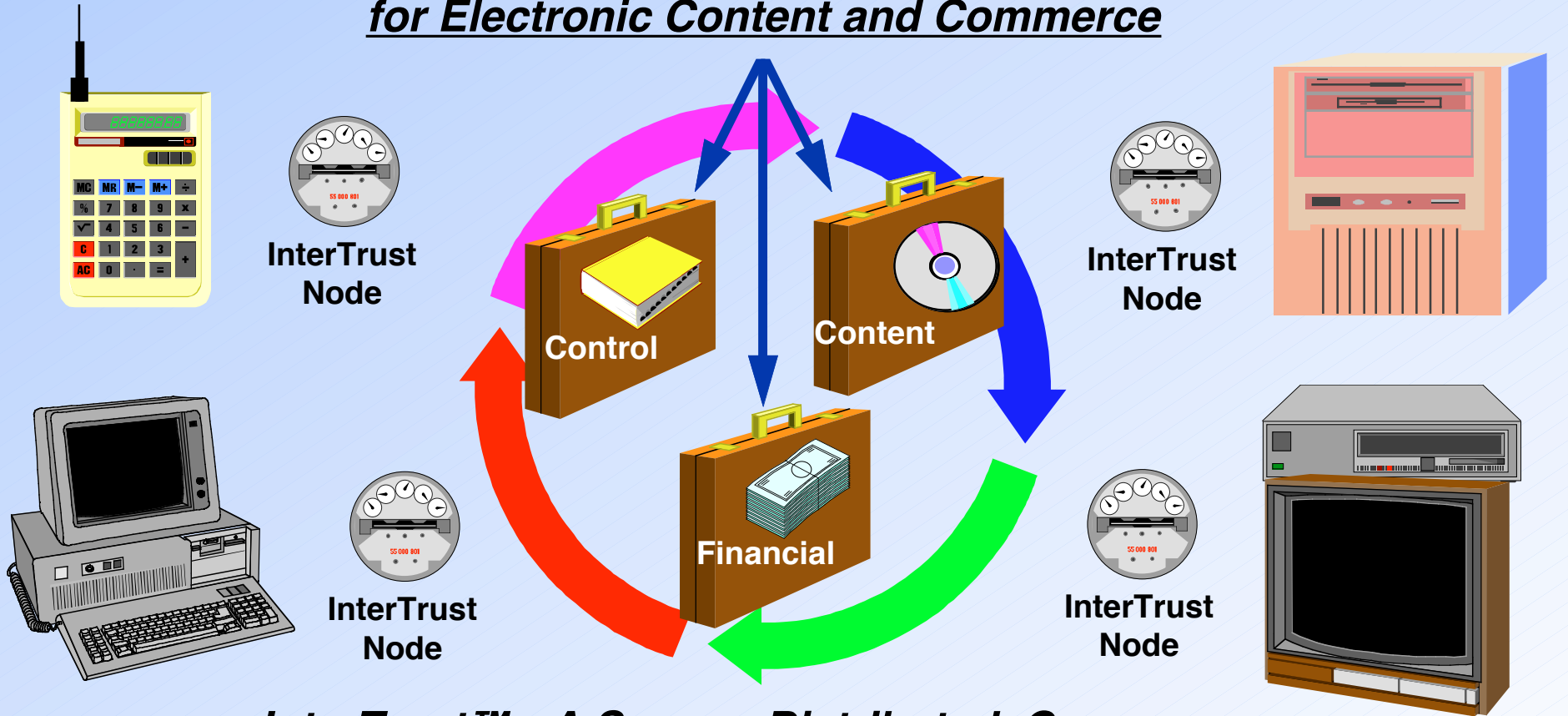
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- n Provide Distributed, Multi-Party, Tamper Resistant, Object Oriented, Generalized, Rights Protection & Transaction Processing Environments**

Rights Protection at Work

DigiBox™ : A Universal Container for Electronic Content and Commerce



InterTrust™ : A Secure, Distributed, Commerce Infrastructure

What are DigiBox & InterTrust?

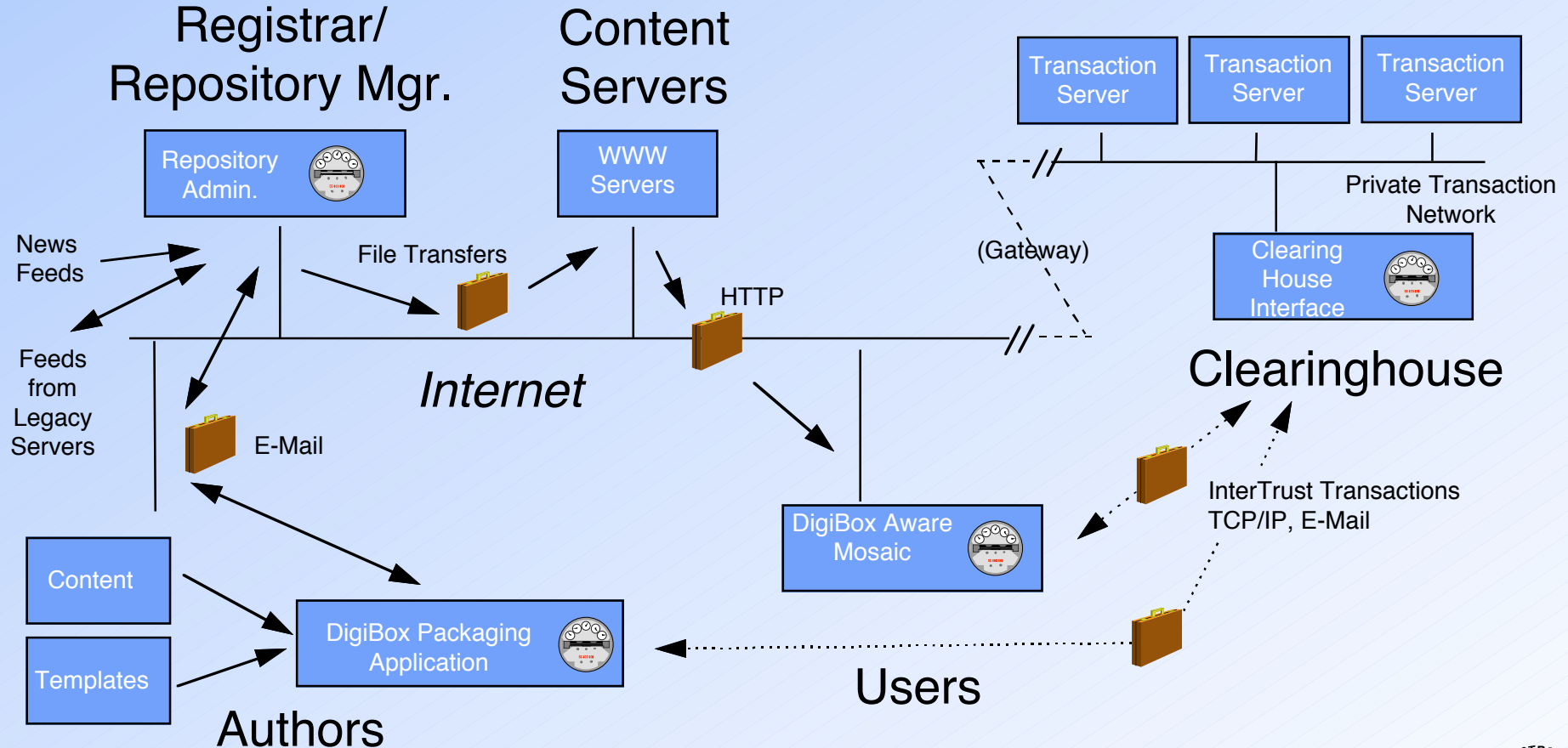
n DigiBox: *A Universal Container for Electronic Content and Commerce*

- Content: Video, Multimedia, Graphics, Text, Software, etc
- Financial: Transaction Information and Credit/Digital Cash
- Control: Content Rights, Permissioning, Administration

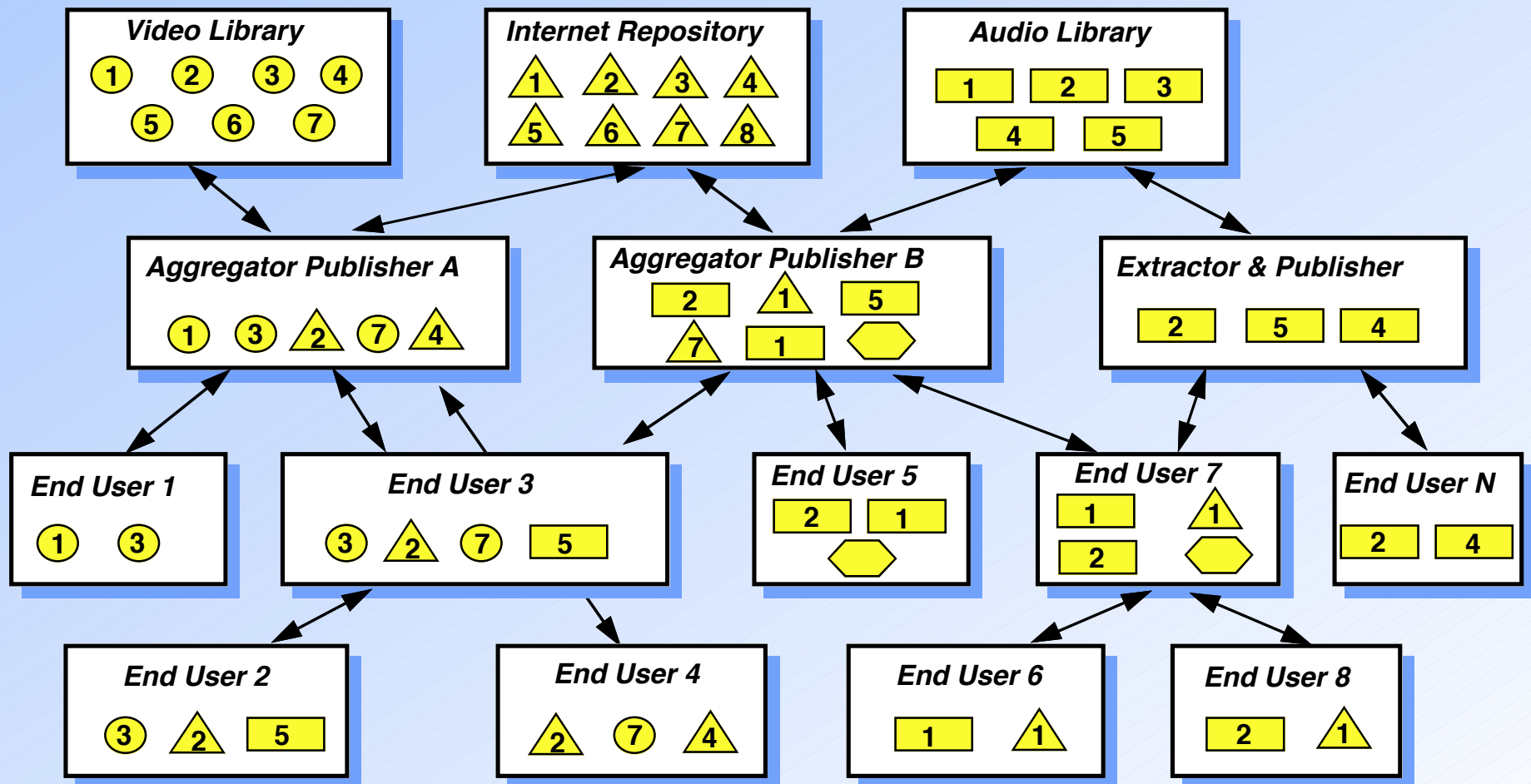
n InterTrust: *A Secure, Distributed Commerce Infrastructure for DigiBox Content & Applications*

- Computers and Other Electronic Appliances
- Running InterTrust Software on Distributed Nodes
- Employs Broadcast, Networks, and/or Media interchange

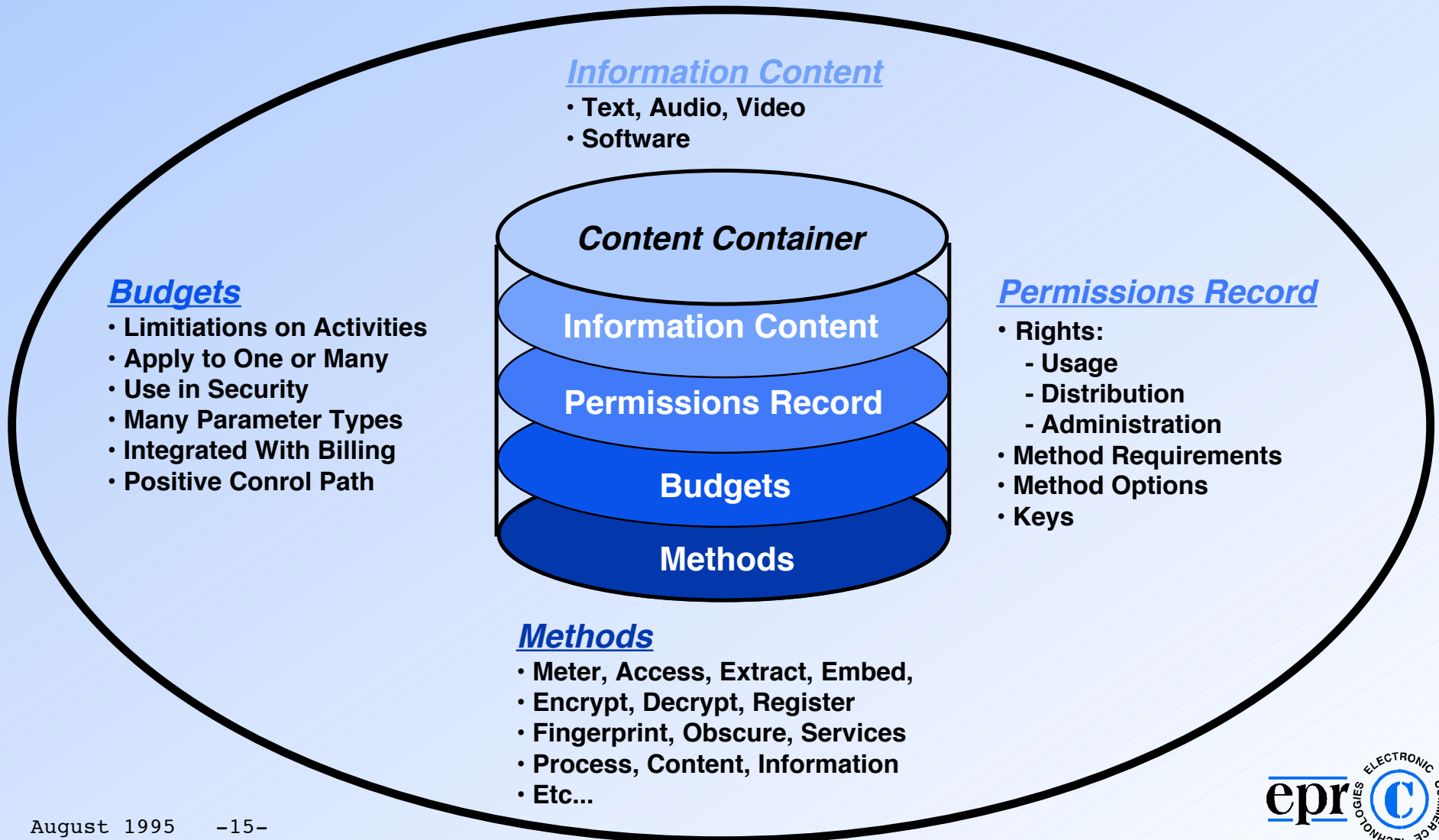
InterTrust / Internet Example



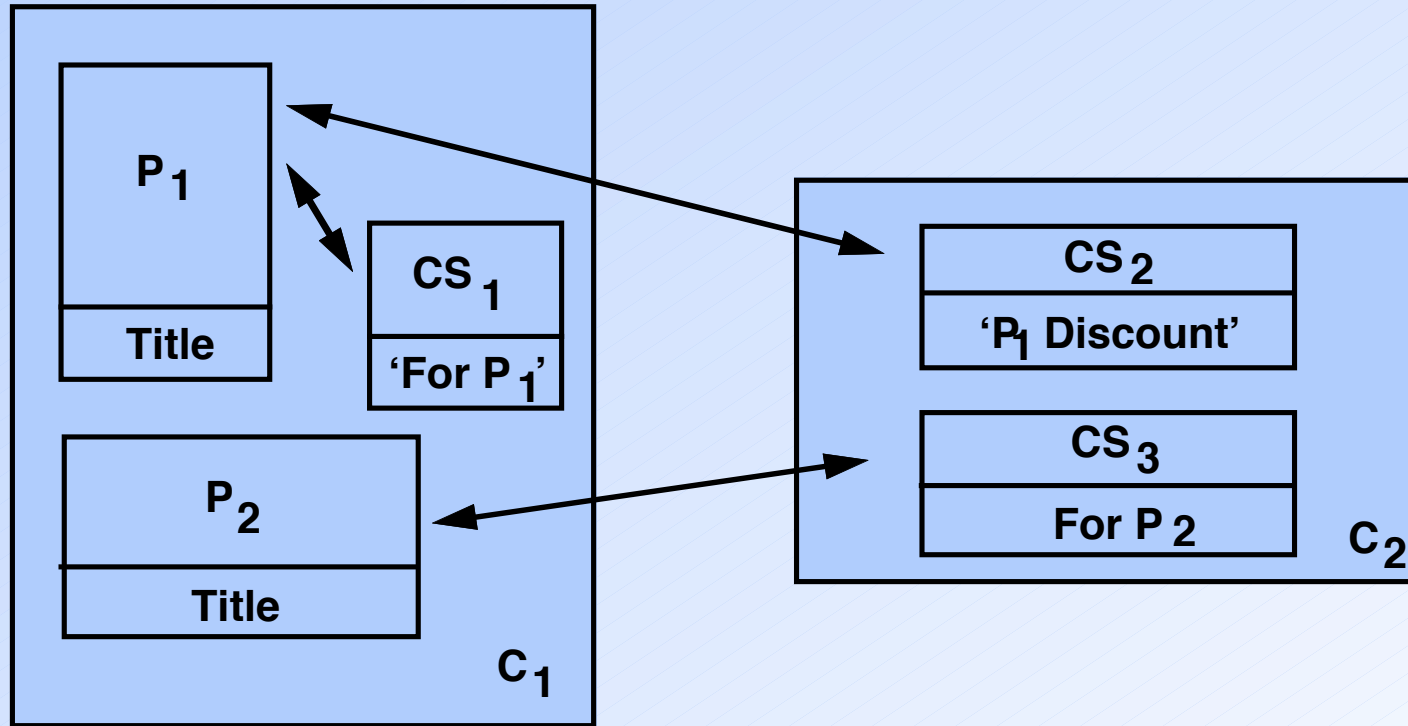
Superdistribution: Chain of Handling & Control



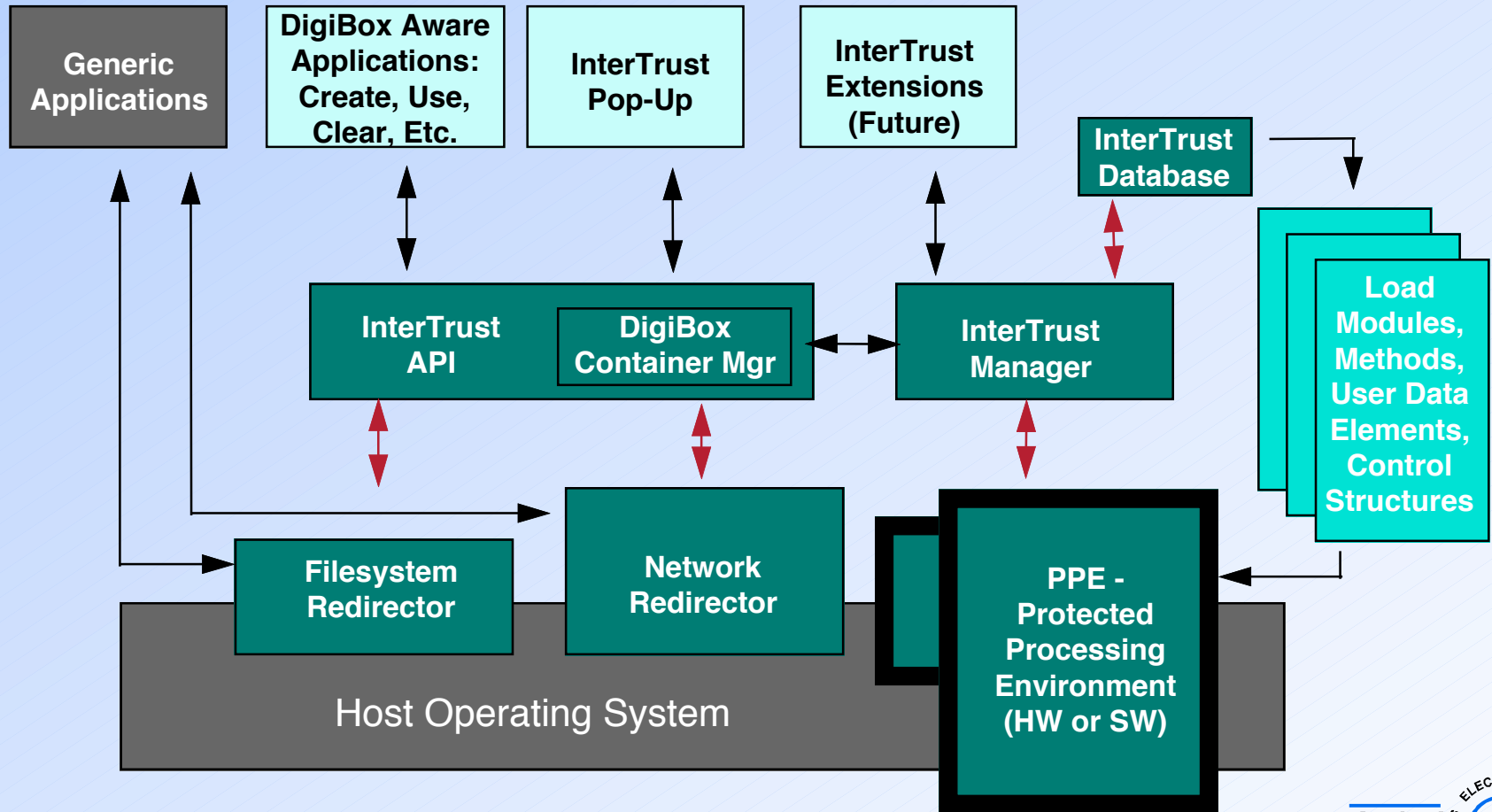
DigiBox Container Structure



Container Logical Organization



InterTrust Protected Processing Environment



Breakthrough Technology

- n **True Chain of Handling & Control = Superdistribution**
- n **Secure Transactions Inside each InterTrust Node**
 - Can be Securely integrated into the Host Operating System
 - Can Employ Secure Hardware Integrated w/the Host
- n **Secure Engine Packages & Processes:**
 - Data Objects (Text, Recordings, Movies, Pictures, Trusted Messaging, Electronic Cash, Credit, Transfers)
 - Control Objects (Rights, Permissions, Price)
- n **This Unique Approach enables implementation of**
 - *Any Number of Commerce Models*
 - *With Any Number of Participants*

Enabling Superdistribution

Electronic Data
Interchange,
Legacy
Connectivity

Security and
Cryptography
Techniques

Electronic
Funds
Transfer,
Banking,
Financial
Centric

Content
Centric
Digital Rights
Info Metering

End to End
Applications w/
Built-in
Electronic
Commerce

Infrastructure
Technologies

EDI

Crypto

EFT

Content

Service

Network

DigiBox

InterTrust

Applications & Users

- n Internet, WWW
- n Software Licensing
- n Digital Cash
- n Information Databases
- n Video on Demand
- n Electronic Shopping
- n E-mail
- n Electronic Advertising
- n Micro Marketing Info Collection
- n Games
- n System Software Providers
- n Computer, Info-Appliance Providers
- n Content Distributors, Aggregators, Creators
- n Common Carriers
- n Cable, Movie, Recording
- n Large Corporations, Government Agencies
- n Chip Makers

Conclusions

n Information Commerce Systems Must:

- Protect ALL the Information in ALL the Transactions
- Support Multiple, Evolving Business Models and Real World Value Chains
- Support Multi-Party, Superdistribution Topologies

n Next Steps:

- Standardize a Neutral Content and Commerce Container
- Proliferate a General Purpose Processing Environment
- Create an Information Commerce Infrastructure with Options for Packaging Tools, Delivery Vehicles, and Clearinghouses

End of Presentation

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Financial Services On the Internet

Tim Duncan

- I. CorpFiNet-The Internet Finance Network
 - Commercial and Corporate Finance on the Internet
 - Information for Business Finance Professionals
 - Content Directory
 - Original Information and Articles
 - Transactions
2. Services.
 - Help Financial Service Companies Use Interactive Technologies
 - Consulting and Strategic Partnerships
 - Web Site Creation and Management
 - Begin to deliver Products and Services On-Line
3. Suggestions:
 - Few Revenue Rewards for 18 to 24 months
 - Start with Objectives
 - Start Small-Push Expenditures Back
 - Learn as You Go, Build on Success
 - Think Information Not Image
 - Improve on Existing Processes and Systems First

End of Presentation

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Internet World - Boston

Tim Duncan

CorpFiNet

How Do You Get An
Internet Related
Business Worth \$10
Million By 1996?

CorpFiNet - The Internet Finance Network

- Commercial and Corporate Finance on the Internet.
- Information for Business Finance Professionals.
- Content Directory.
- Original Information and Articles.
- Transactions.
- Consulting, Web Site Development and Management, Strategic Partnerships for Financial Service Companies.

CorpFiNet Objectives

- Attract a Target Audience in a Specific Vertical Business Market.
- Learn About What the Audience Wants.
- Help Clients Sell to the Audience.
- Help Clients Transact Business.

Points for Content Providers:

- Start-Ups Still Require Time and Capital.
- Revenue Generation Today From Education & Know-How.
- Revenue Generation Tomorrow From Delivering Business.
- This is an Information Business not Entertainment.
- Information is the “Toaster” of Tomorrow.

How Do You Get An
Internet Related
Business Worth \$10
Million By 1996?

You Invest \$20
Million In 1995

End of Presentation

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Subject: Laura Fillmore's Presentation to IW95

Here are the URLs of Laura Fillmore's presentation to the Internet World 95 Conference.

Her presentation consists of a title page:

<http://www.obs-us.com/obs/english/papers/iw95/top.htm>

a table of contents (overview of the 9 maxims Laura talked about):

<http://www.obs-us.com/obs/english/papers/iw95/maxims.htm>

and the 9 following files detailing on the 9 maxims:

<http://www.obs-us.com/obs/english/papers/iw95/newcol.htm>

<http://www.obs-us.com/obs/english/papers/iw95/learn.htm>

<http://www.obs-us.com/obs/english/papers/iw95/custom.htm>

<http://www.obs-us.com/obs/english/papers/iw95/collab.htm>

<http://www.obs-us.com/obs/english/papers/iw95/linkthin.htm>

<http://www.obs-us.com/obs/english/papers/iw95/distrib.htm>

<http://www.obs-us.com/obs/english/papers/iw95/enabler.htm>

<http://www.obs-us.com/obs/english/papers/iw95/living.htm>

<http://www.obs-us.com/obs/english/papers/iw95/respons.htm>

--- Open Book Systems - OBS (formerly Online BookStore) ---

End of Presentation

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International Commerce

International Aspects of Internetting

Czeslaw Jan Grycz

Grycz@Poniecki.Haas.Berkeley.edu

Background

What Right Do I Have to Talk About This?

- ✓ Publisher, lecturer, writer, consultant -1965-present
- ✓ DLA Office of the President, UC - 1989-1994 (Retired in 1994)
- ✓ Prototyped large-scale e-publishing projects
- ✓ Co-authored *The New Riders' Official Internet Yellow Pages*
- ✓ Director, **Wladyslaw Poniecki Charitable Foundation, Inc.**, international networking and publishing
- ✓ V.P., **Santa Fe Ventures, Inc.**, PBS program and network productions, www consulting, integrated media
- ✓ Burned fingers and involved in enriching experiences

What will be Covered

Setting the Stage for Laura Fillmore

- ✓ I. Internetting Issues
 - ➡ Components of international Internetting
- ✓ II. Case Study
 - ➡ An example from Central and Eastern Europe
- ✓ III. Conclusions and Recommendations
 - ➡ Is there profit in getting involved?



I INTERNETTING ISSUES

What's involved in
Internationalization?

Components of International Internetting

1. You extend the Internet into new territories
2. You're involved in practical implementation of consensus decision-making
3. Living example of democratic governance
4. Provide mechanisms for free speech
5. Build online communities and strengthen existing ones
6. You can develop business potential

1. You extend the Internet (its ideals and its challenges)

- ✓ World's largest communication enterprise ever-known; defies easy definition
- ✓ Bi-directional communication (interactivity)
- ✓ “Access” is the first key to understanding the Internet; “listening” is the second
- ✓ Dynamics have geo-political implications; we don't yet adequately understand these

2. You Demonstrate Consensus Decision-Making

- ✓ Internet has no governing body, *per se*
- ✓ Lots of contributing entities
- ✓ Problem-solving with a variety of experts
- ✓ Local involvement generates commitment
- ✓ You need to build confidence in your partners
- ✓ Leadership is as important as ever
- ✓ Watch local standards, copyright, censorship

3. You implement Democractic Governance

- ✓ Important to provide leadership with respect for individual differences (personal, cultural, national)
- ✓ Variety of skillsets necessary
- ✓ Absence of real collaborative tools
- ✓ Legislative vs. local controls
- ✓ Backwardness of a “broadcast” mentality

4. Providing Mechanisms for Free-speech

- ✓ Some countries resist Internet expansion
- ✓ Requires a variety of points of access
 - * Governmental
 - * Institutional (higher ed, mainly)
 - * NGO
 - * Public / Individual
- ✓ Mentoring on the Internet

5. Building Communities and strengthening existing ones

- ✓ What is the right analogy? 30,000,000 users? - or - 1,000,000 groups of 30 interested participants?
- ✓ Networking and collaborative tools far behind job control, remote access, and individual communications ones
- ✓ The problem of “Globalization” in Strengthening Local Communities

6. Developing Businesses

- ✓ New ground rules by which to play...
 - * Win-Win
 - * Based on open information systems/processes
 - * Need for non-profit citizen/industry coalitions
 - * Increase in joint ventures/joint profit sharing
 - * Environmentally sensitive
 - * Whose is the market?



II

Case History

The Environmental Training Project's
“EcoDirectory of Central and
Eastern European Environmental
Libraries”

The “EcoDirectory” Project

- ✓ US-Agency for International Development
(UMinn, UPitts Center for Hazardous Materials Research, Institute for Sustainable Communities, World Wildlife Foundation; Sub-Contractor: Poniecki Foundation)
- ✓ Collaborative Library Project
- ✓ Learn while doing; Internet/Eco-Directory
- ✓ Establishing sustainable bodies: IOIS
- ✓ Creative newness: ILS proposal ==>>>>>>>

Lessons from the Library Project

- ✓ Technology - Infrastructure
- ✓ People - Preparedness and commitment
- ✓ Language - Communications
- ✓ Culture - Behavior
- ✓ Publishing - Content *is* the value
- ✓ Legislation - Policy issues *are* critical
- ✓ Commerce - Doing business

Policy Issues

- ✓ Team and Internet (community) developed
- ✓ Ease of use
(range of participant knowledge)
- ✓ Critical mass (availability of resources)
- ✓ Extensibility (applicable elsewhere)
- ✓ Reciprocity
(the provider will also become a customer)

Indicators of Quality on the Internet

- ✓ Recognition by one's peers (or grateful audience; or response of marketplace)
- ✓ Publisher acceptance (Imprint)
- ✓ "Seal of Approval" (Society Endorsement)
- ✓ Evaluation process (Peer Review)
- ✓ Respected individual authority (Mentoring)

Building Sustainable Communities

- ✓ Emerging from the “EcoDirectory” Project... the idea of a membership-driven, multi-disciplinary association in Central and Eastern Europe... with potential expansion to other sites: IOIS.

International Organization of Information Specialists (IOIS)

- ✓ International scope and outreach (CEE)
- ✓ \$\$\$ help provide training, translations, travel, meetings, pilot projects
- ✓ Membership-driven
- ✓ Exporting successful models and adapting them locally
- ✓ \$50./yr - U.S. dues

International Organization of Information Specialists [IOIS]

c/o

Wladyslaw Poniecki Charitable Foundation, Inc.

8637 Arbor Drive

El Cerrito, CA 94530-2728

Grycz@Poniecki.Haas.Berkeley.edu

The next Stage

An unexpected development

- ✓ From the “EcoDirectory” and the initial “IOIS” meetings, came the realization of a need for a new kind of school: to train information managers for the 21st Century: the emergence of the International Library School project.

International Library School

Training Managers of Digital Libraries for the 21st Century

- ✓ Torun, Poland
(birthplace of Nicholas Copernicus)
- ✓ Postgraduate degrees: courses, utilizing distance ed., local lectures, Internet, internships
- ✓ Students from East as well as West
- ✓ Faculty, technology, software, and founding partners are all needed...

International Library School

Training Managers of Digital Libraries for the 21st Century

c/o

Wladyslaw Poniecki Charitable Foundation, Inc.

8637 Arbor Drive

El Cerrito, CA 94530-2728

Grycz@Poniecki.Haas.Berkeley.edu

International Internetting Truisms

- ✓ The true value of the Internet is in its bi-directional flow of information...
- ✓ What information you decide to publish on the Internet is as important as the information you retrieve...
- ✓ Service and support will generate loyalty and sales...



III

Conclusions, Predictions and Recommendations

Conclusions

Why You Should Become Involved

- ✓ **Ethical:** Responsibility of those ...
“...to whom much has been given...”
- ✓ **Social:** Surest way towards evolving a positive human presence on this earth (peace)
- ✓ **Cultural:** World populations are individually gifted; possess unique and critical values
- ✓ **Economic:** Business opportunities abound in both directions

Predictions

- ✓ Internet will be recognized in 2020 as most effective tool of disseminating democratic free-market philosophies
- ✓ Pure capitalism will not be allowed to dominate, online communities will preserve the intrinsic social value of the Internet experiment
- ✓ Businesses will have integrated Internetting

Recommendations

- ✓ Focus on **Service** for an initial international Internetting effort
- ✓ Learn to seek out and value cultural differences
- ✓ Join IOIS to help others help themselves (develop local preparadness)
- ✓ Participate in the International Library School (teach, financial support, internships)



Enjoy!

Czeslaw Jan Grycz

Grycz@Poniecki.Haas.Berkeley.edu

End of Presentation

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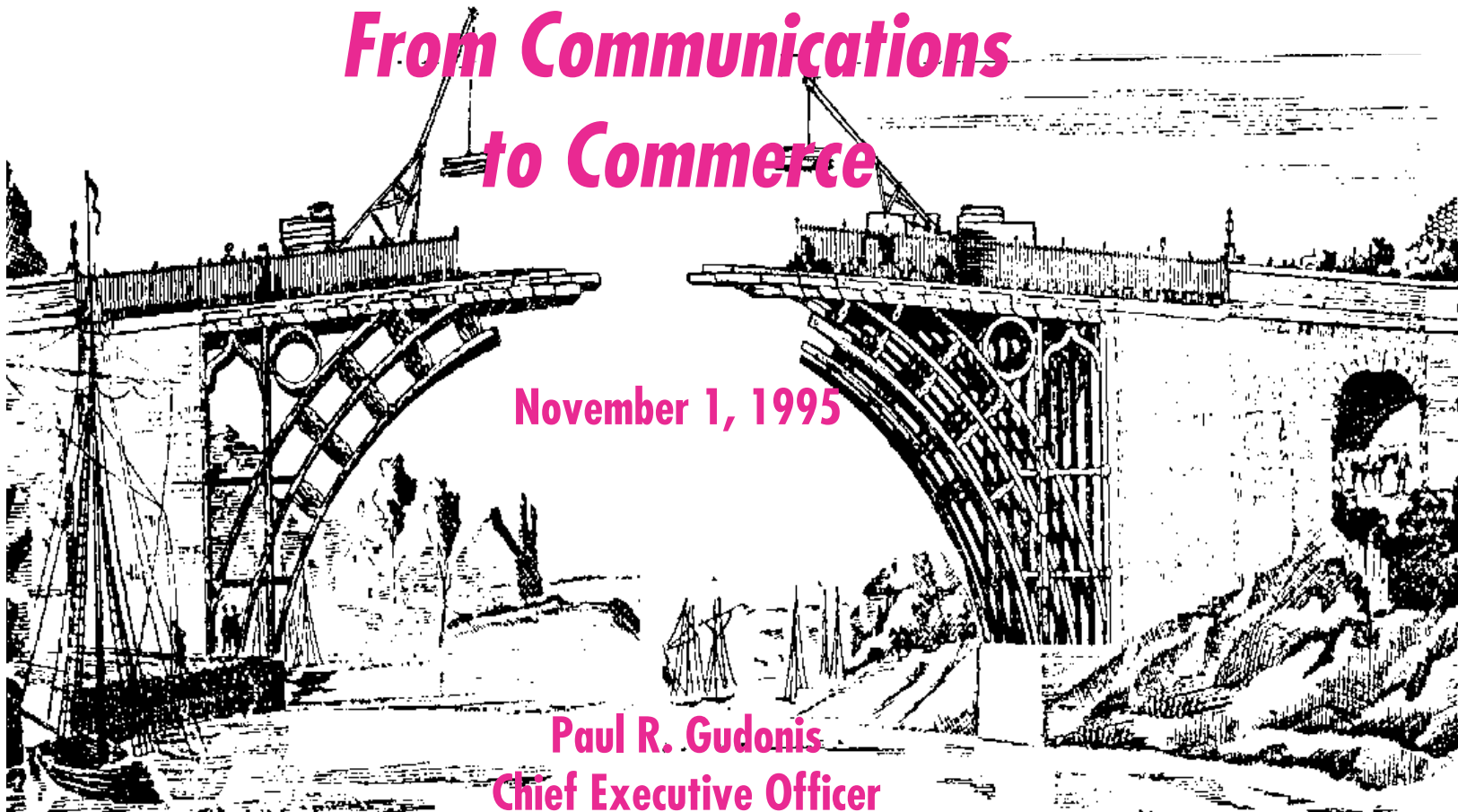
Presentation





INTERNET WORLD — Boston, MA.

Crossing The Chasm : *From Communications to Commerce*



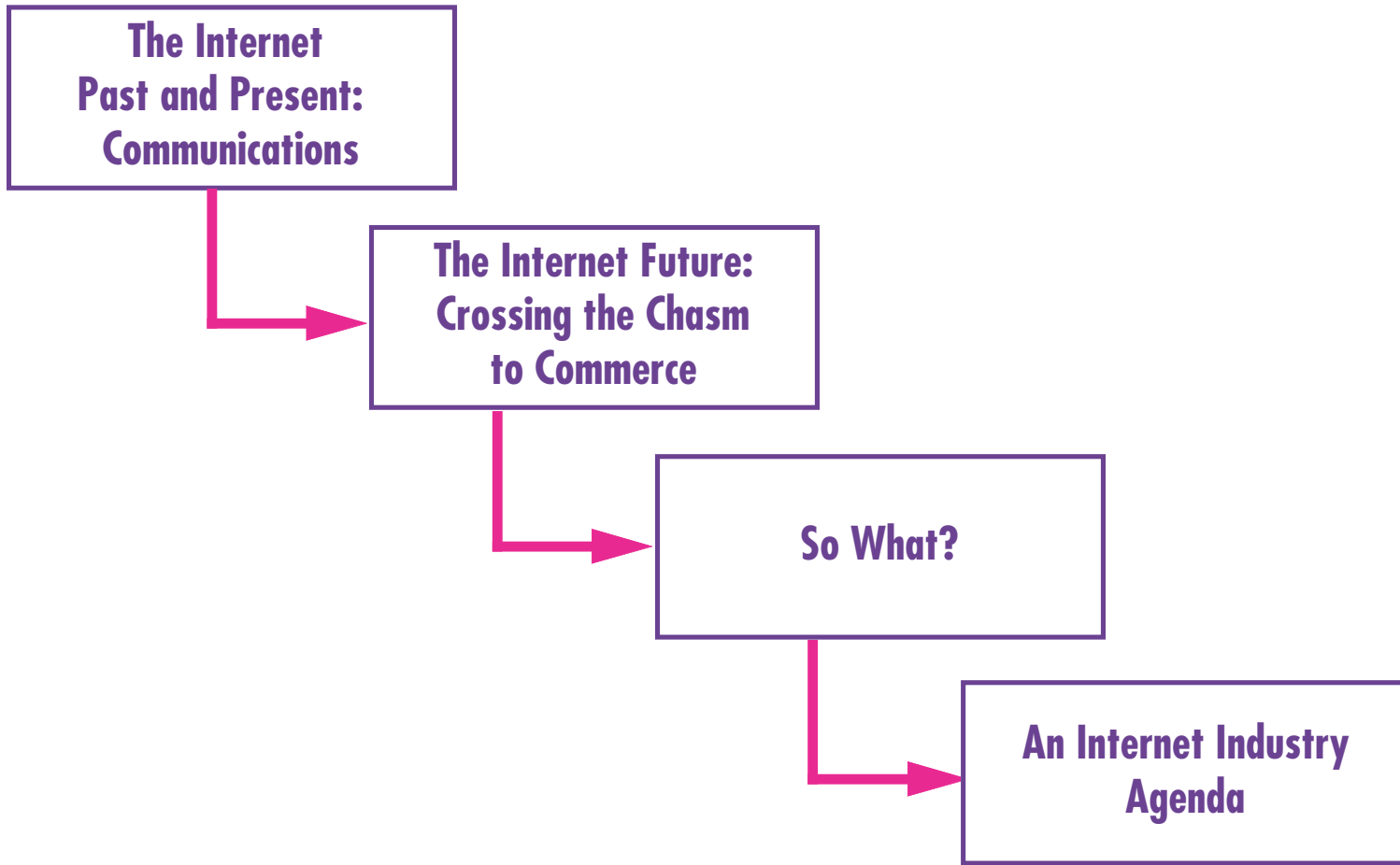
November 1, 1995

Paul R. Gudonis
Chief Executive Officer
BBN Planet

BBN Planet Corporation



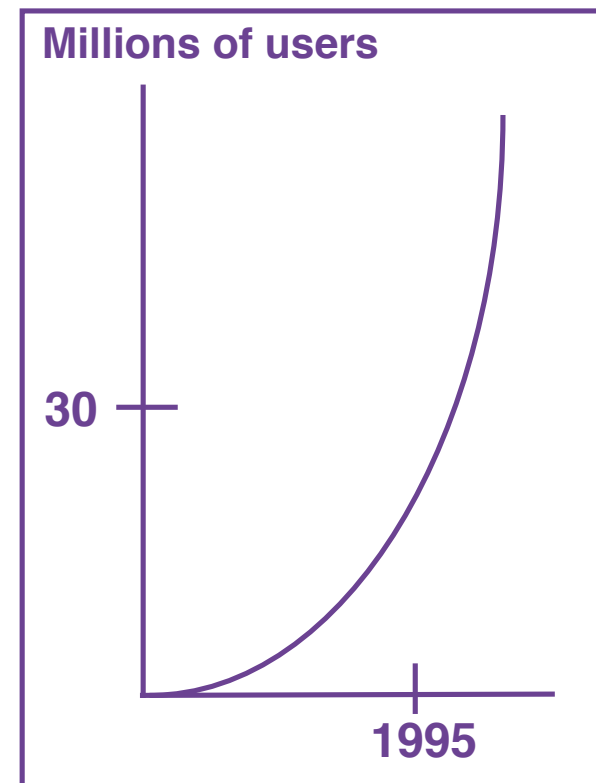
From Communications to Commerce





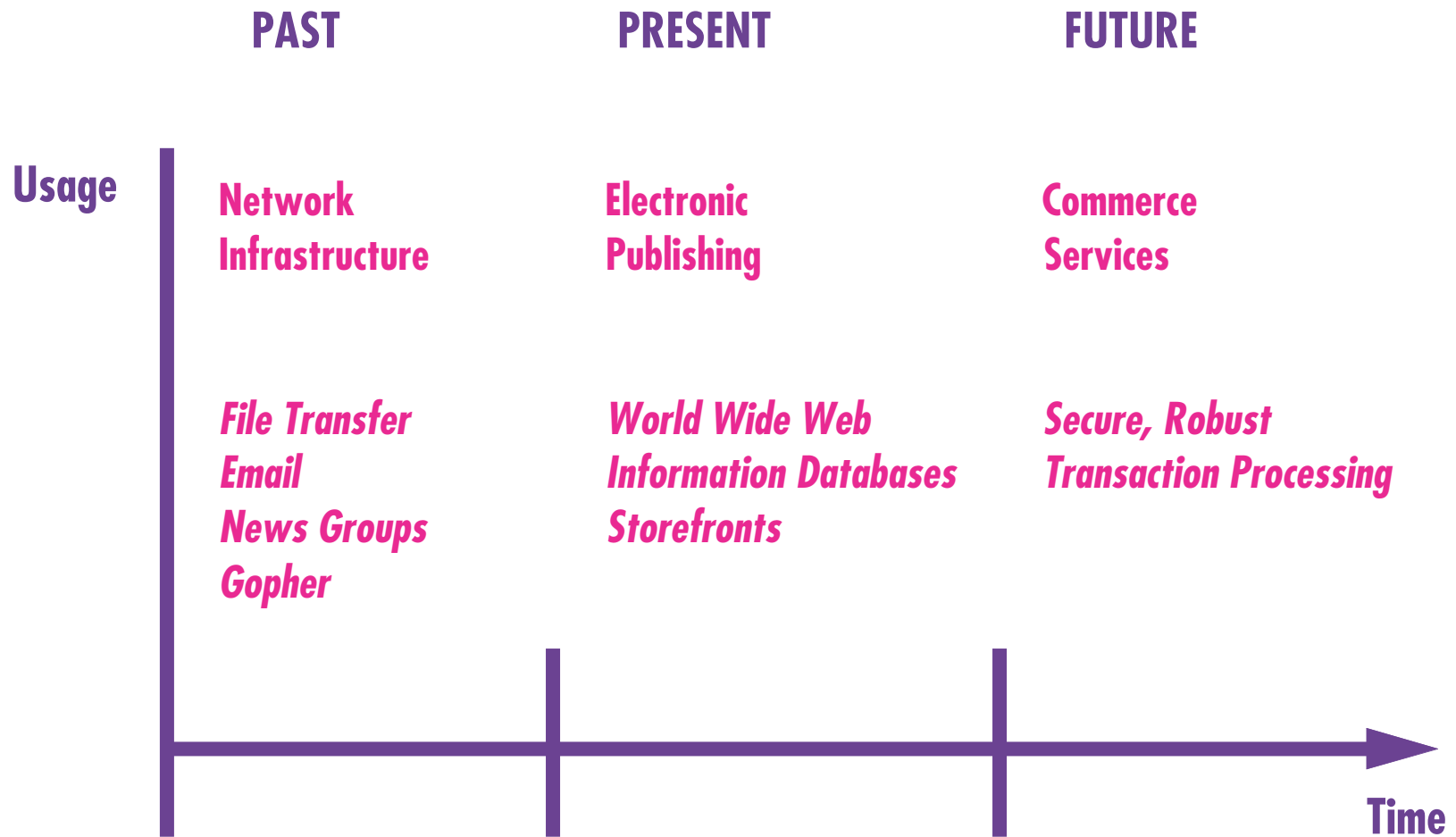
Will the Internet Matter?

- u 30-40 million users connected today
- u 100+ million in a few years
- u Any computer able to talk to any other
- u What we take for granted with phone service





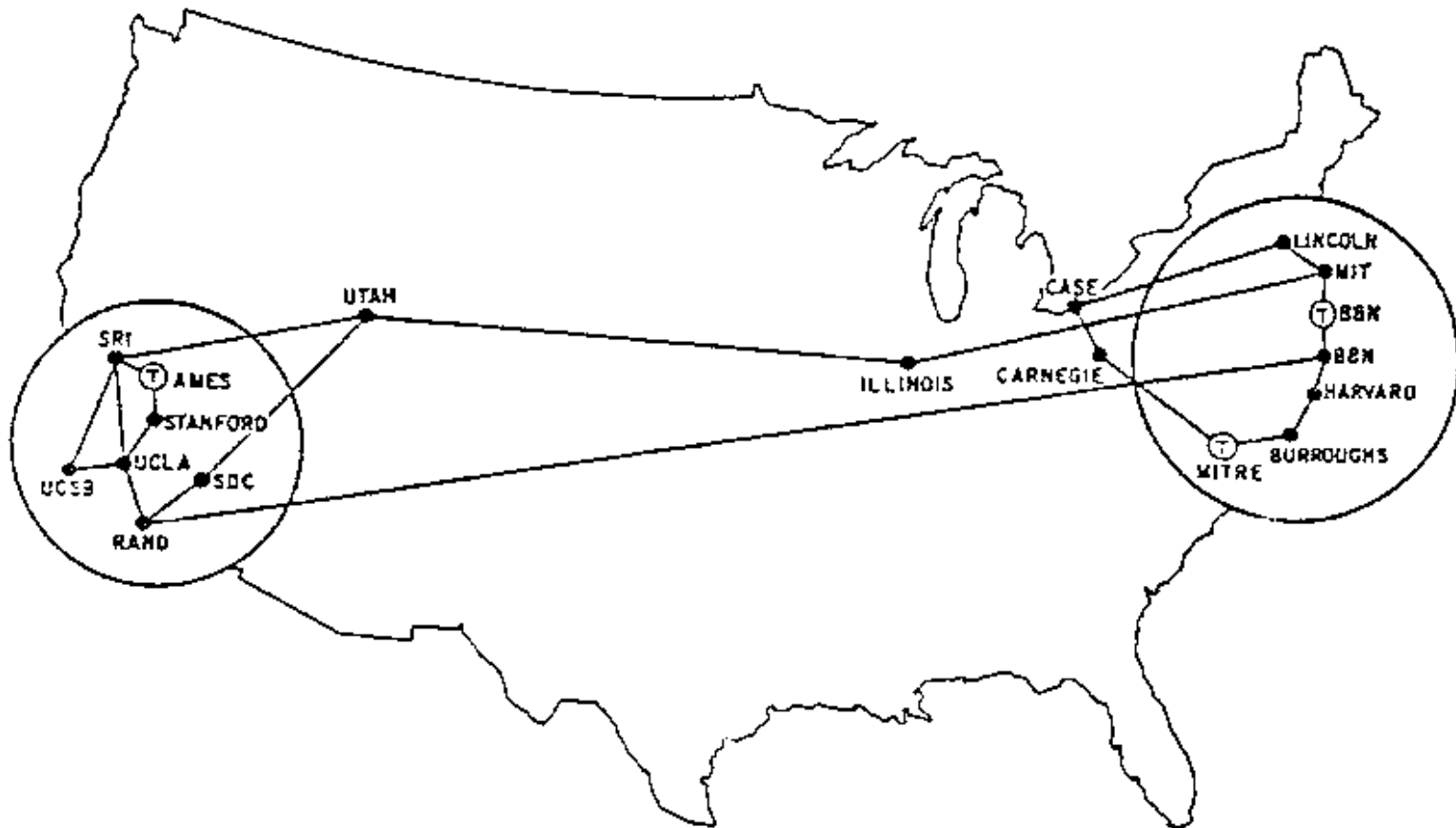
Internet Usage Evolution





The Internet Past

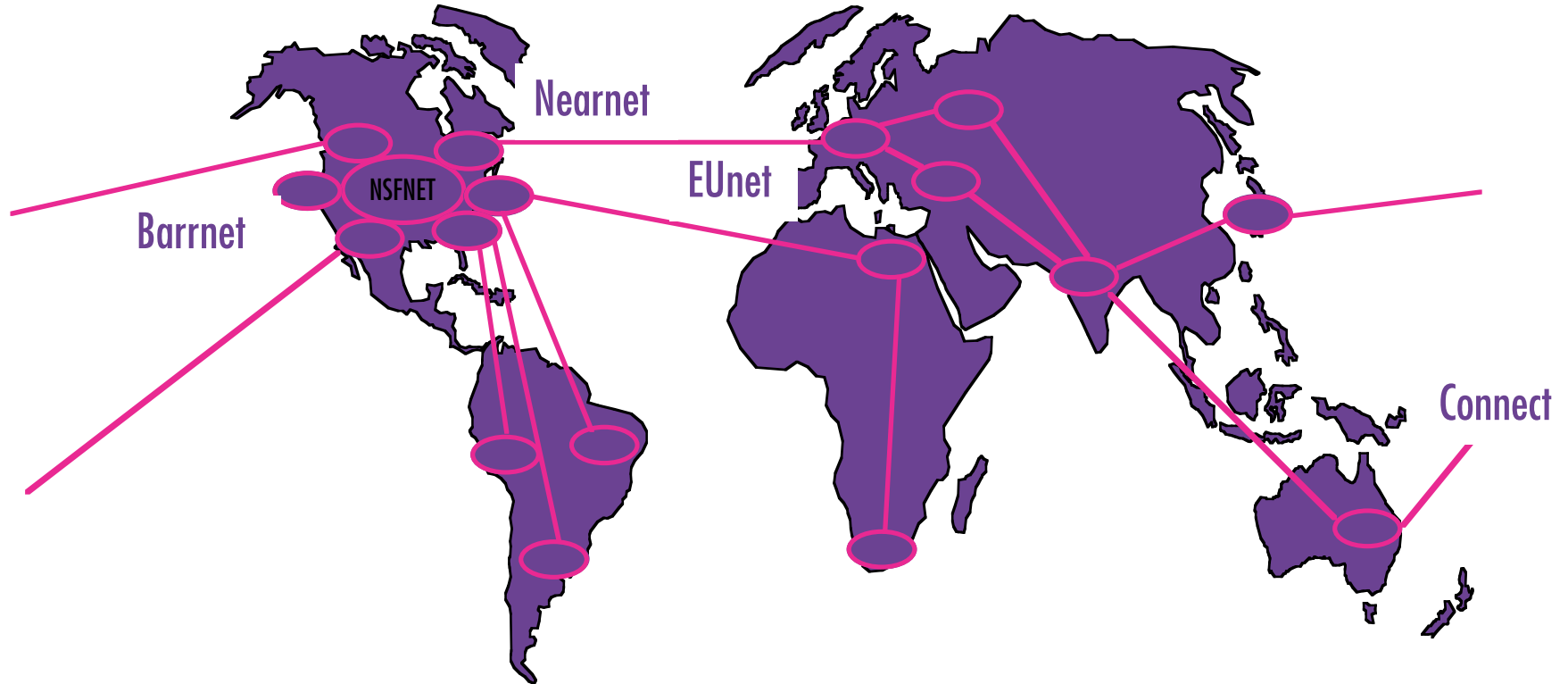
The Arpanet - 1971





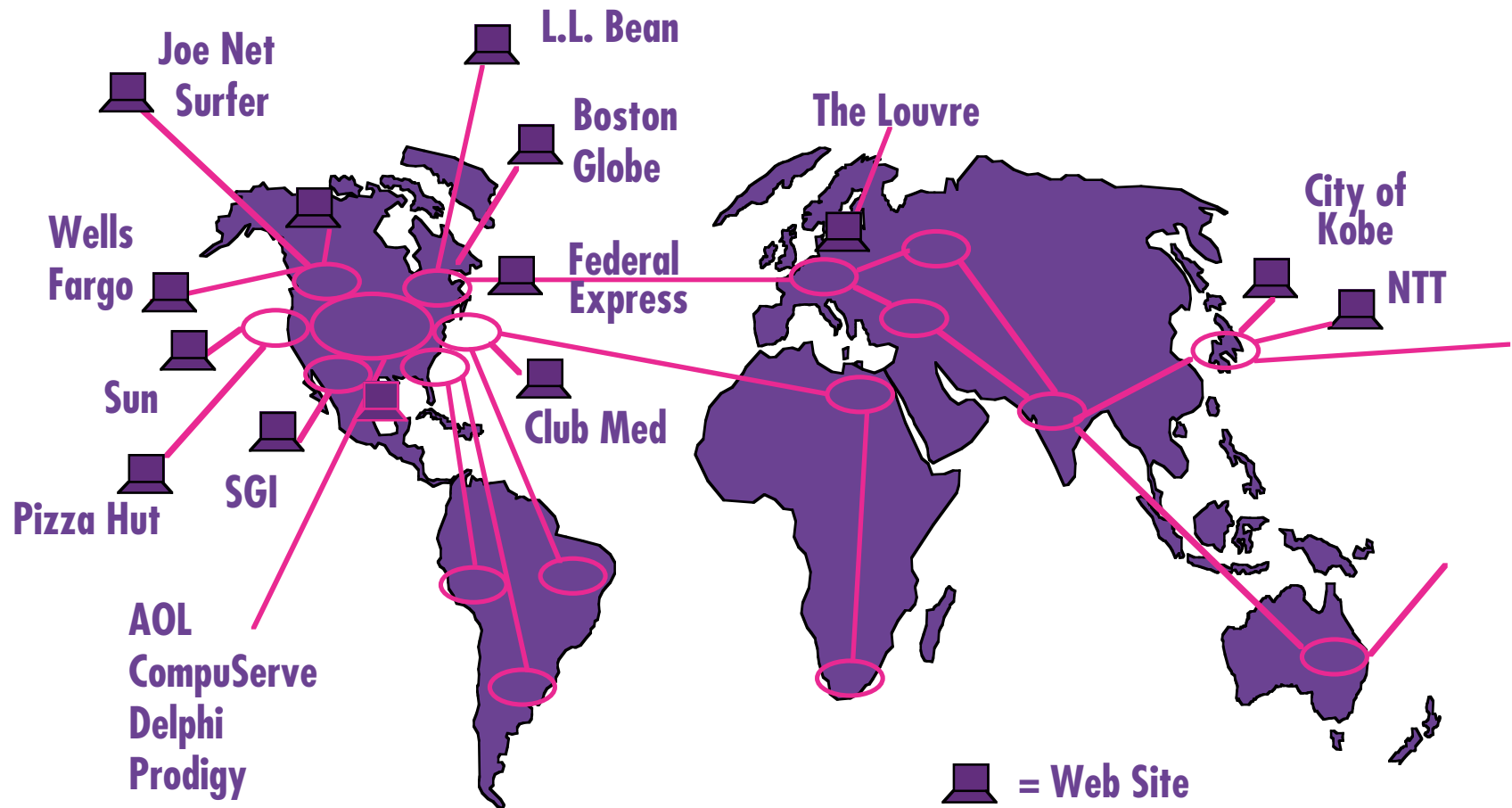
The Internet Past

Network Infrastructure





The Internet Present: On Ramps and Web Sites





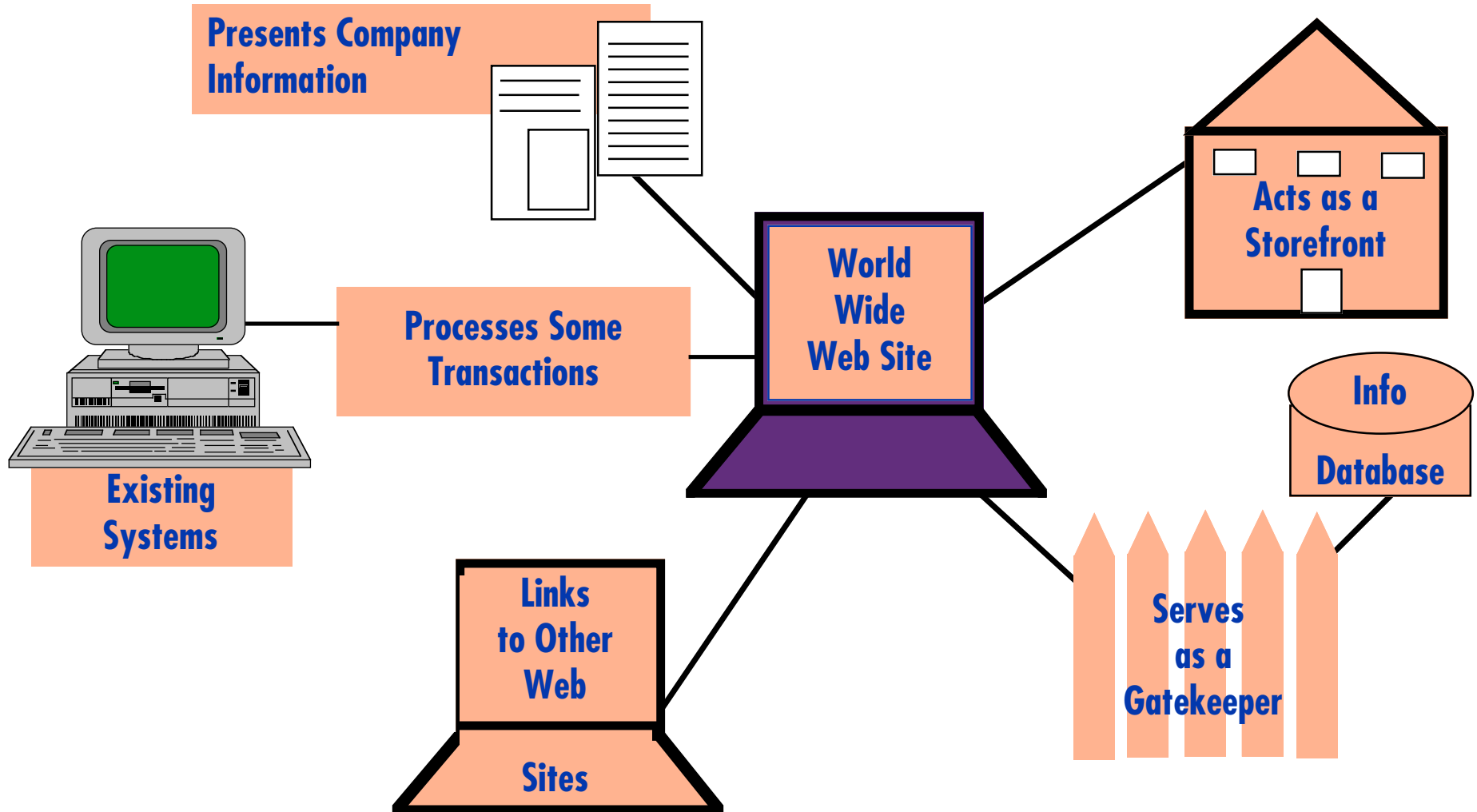
The Internet Present

Businesses are using the Internet to Electronically Publish

- u Product Brochures
- u Catalogs
- u Technical Specs
- u News/Research Documents
- u FAQ'S
- u Software Demos
- u Annual Reports
- u Press Releases
- u Telephone Directories
- u Schedules
- u Price Lists
- u Order Status

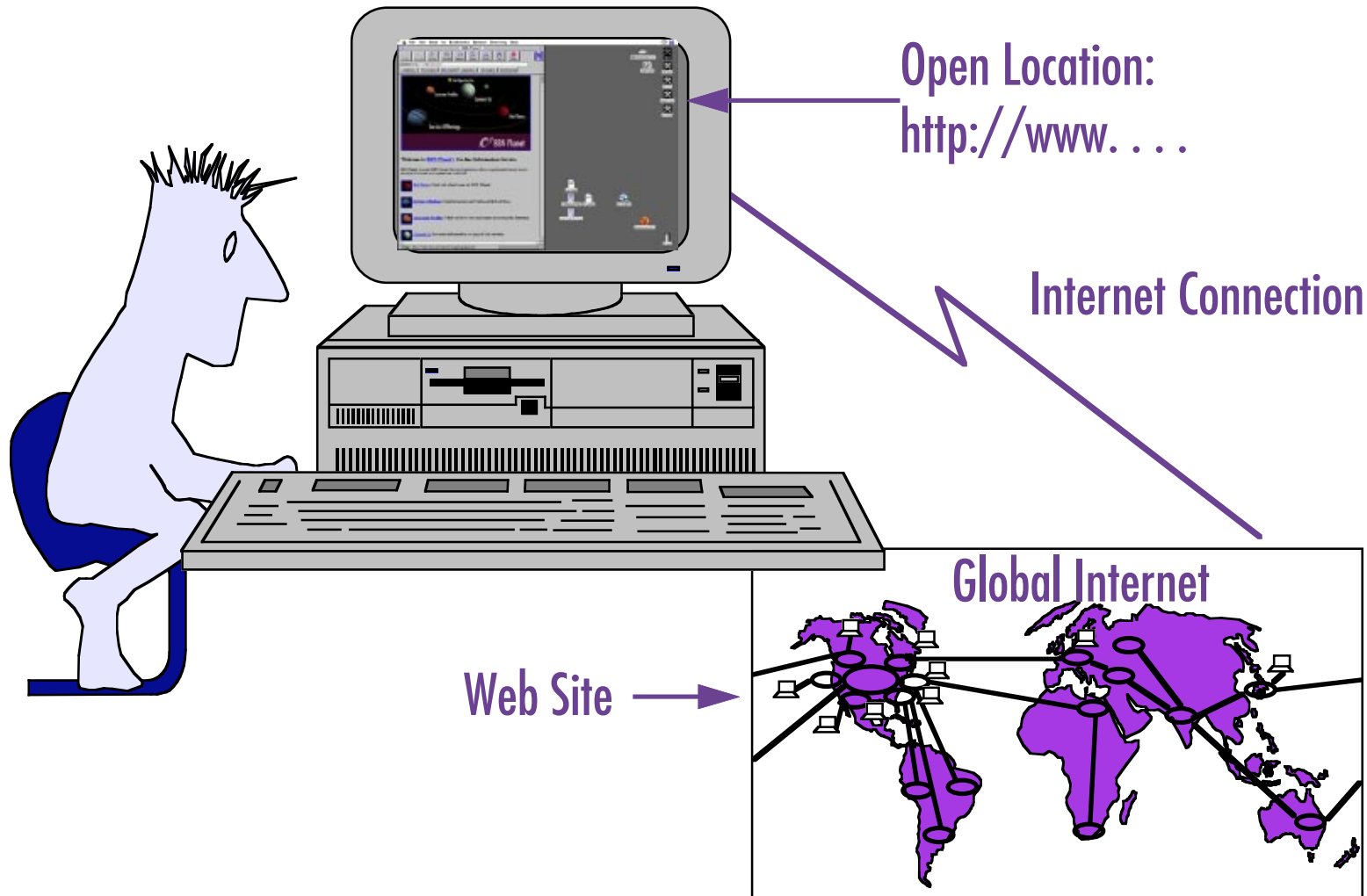


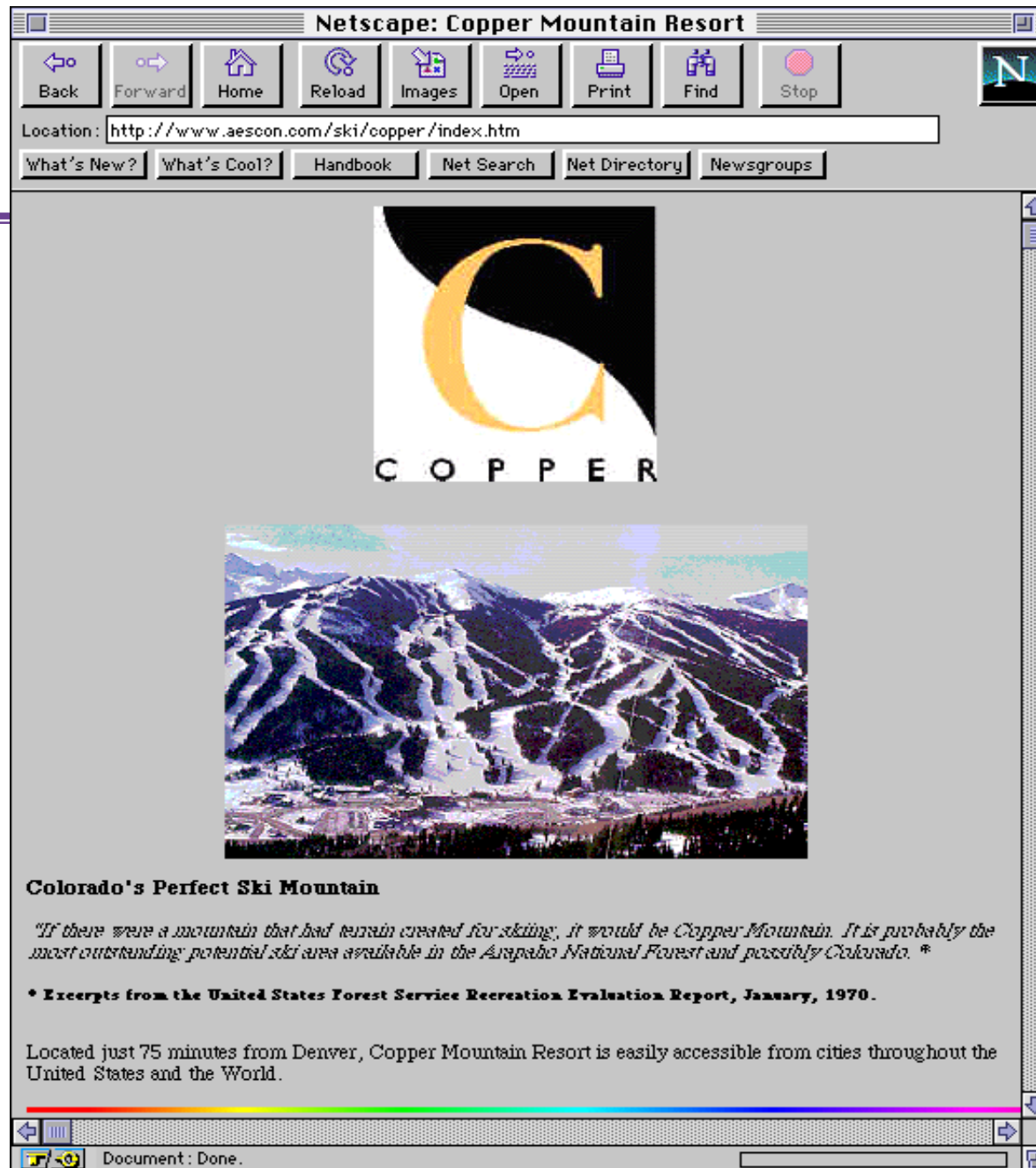
How is the Web Useful?



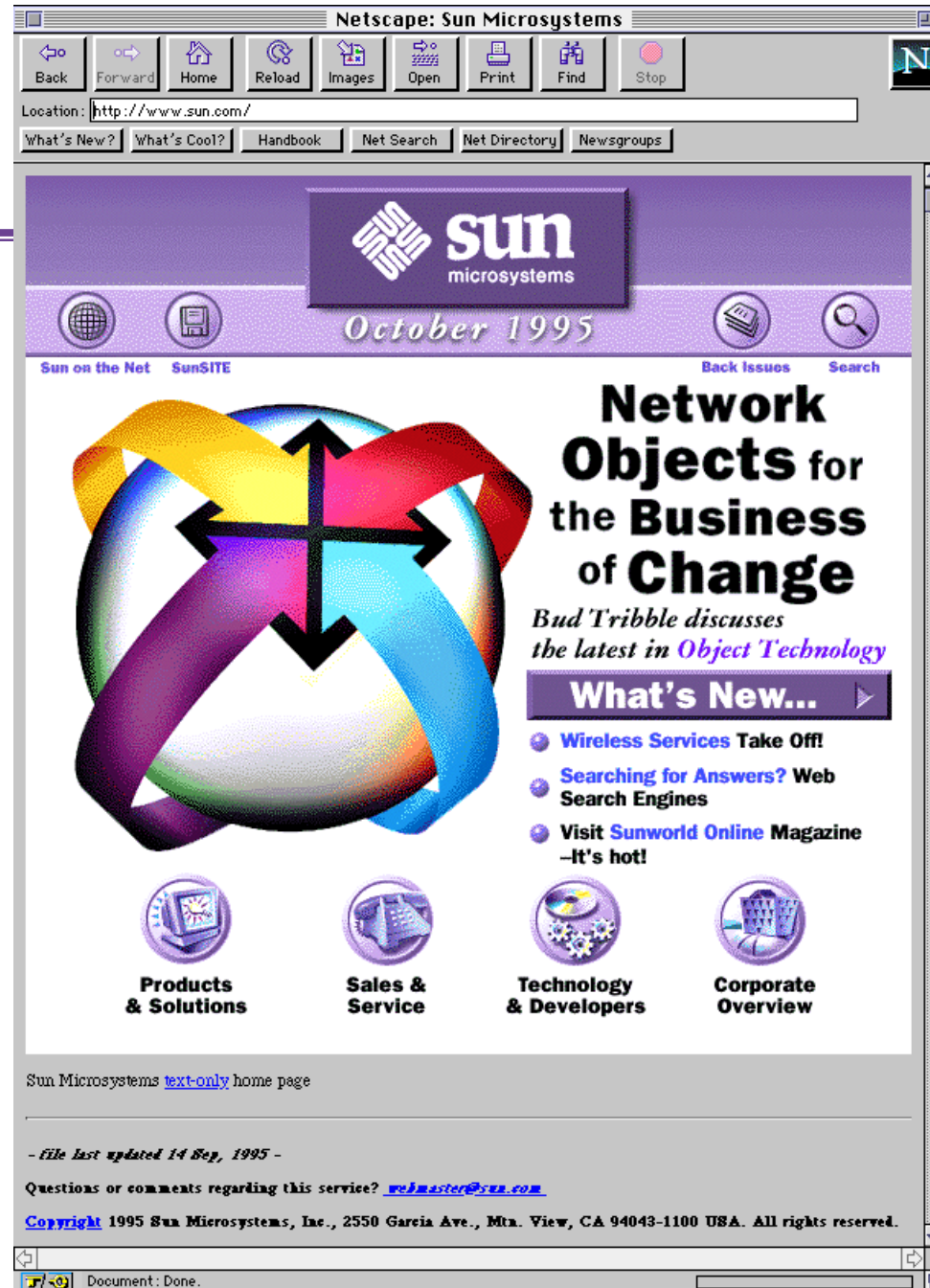


Let's Take a Present Day Tour of Business Sites on the Internet







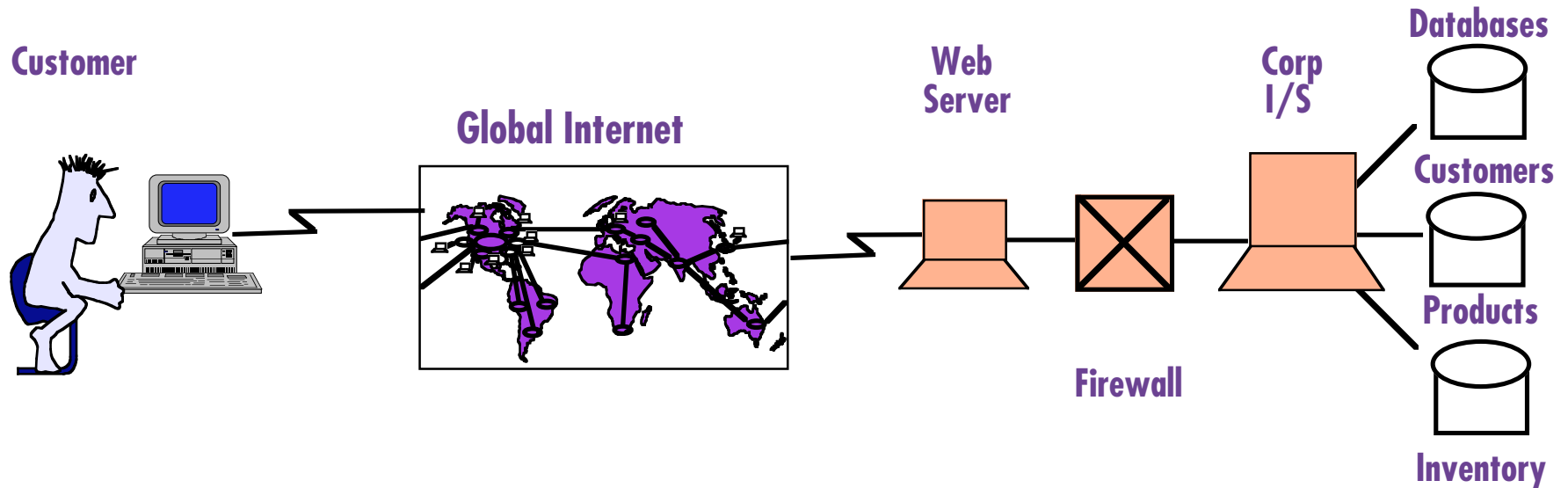




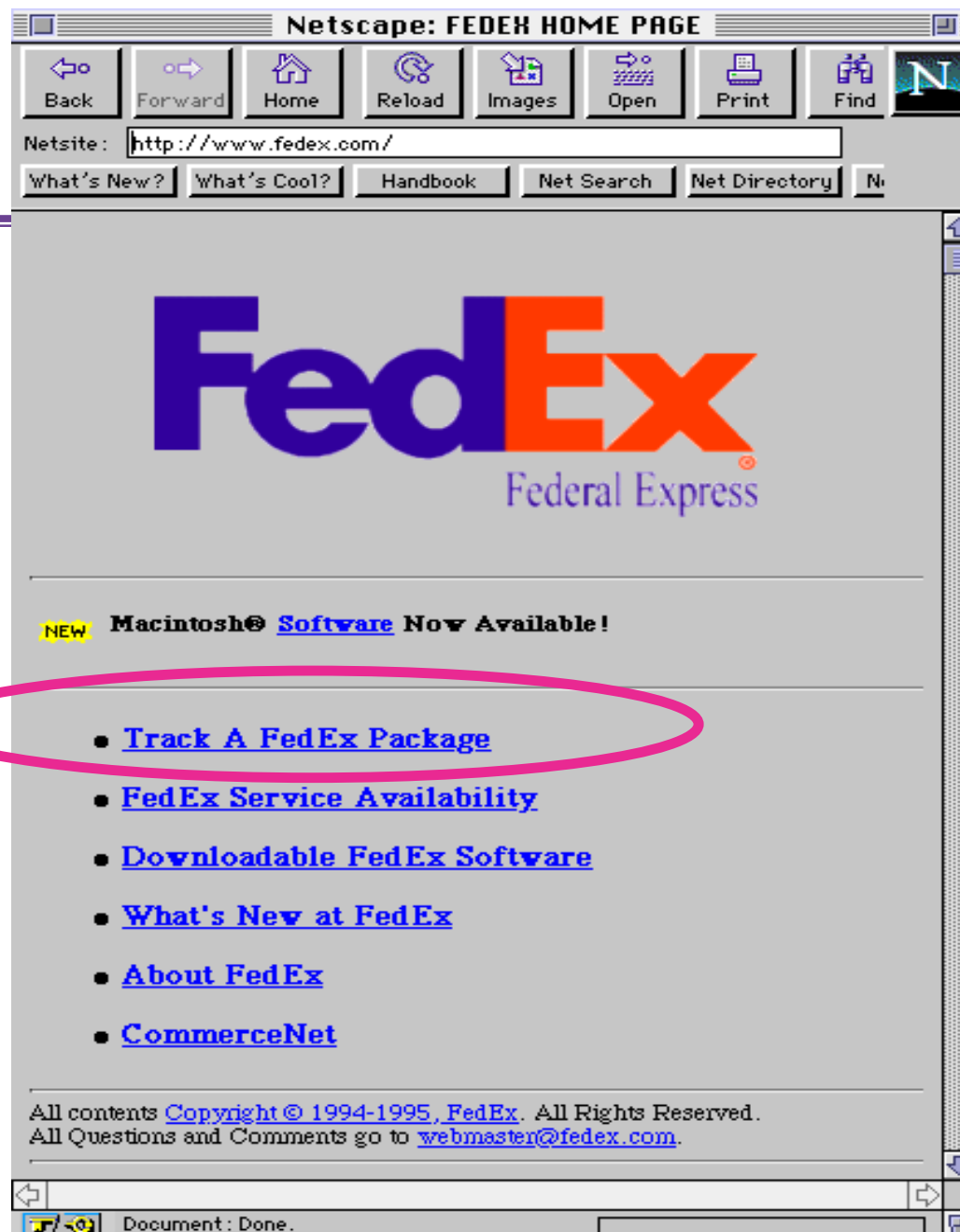




Providing Access to Corporate Databases



For: Order Status
Transaction Records
Product Information

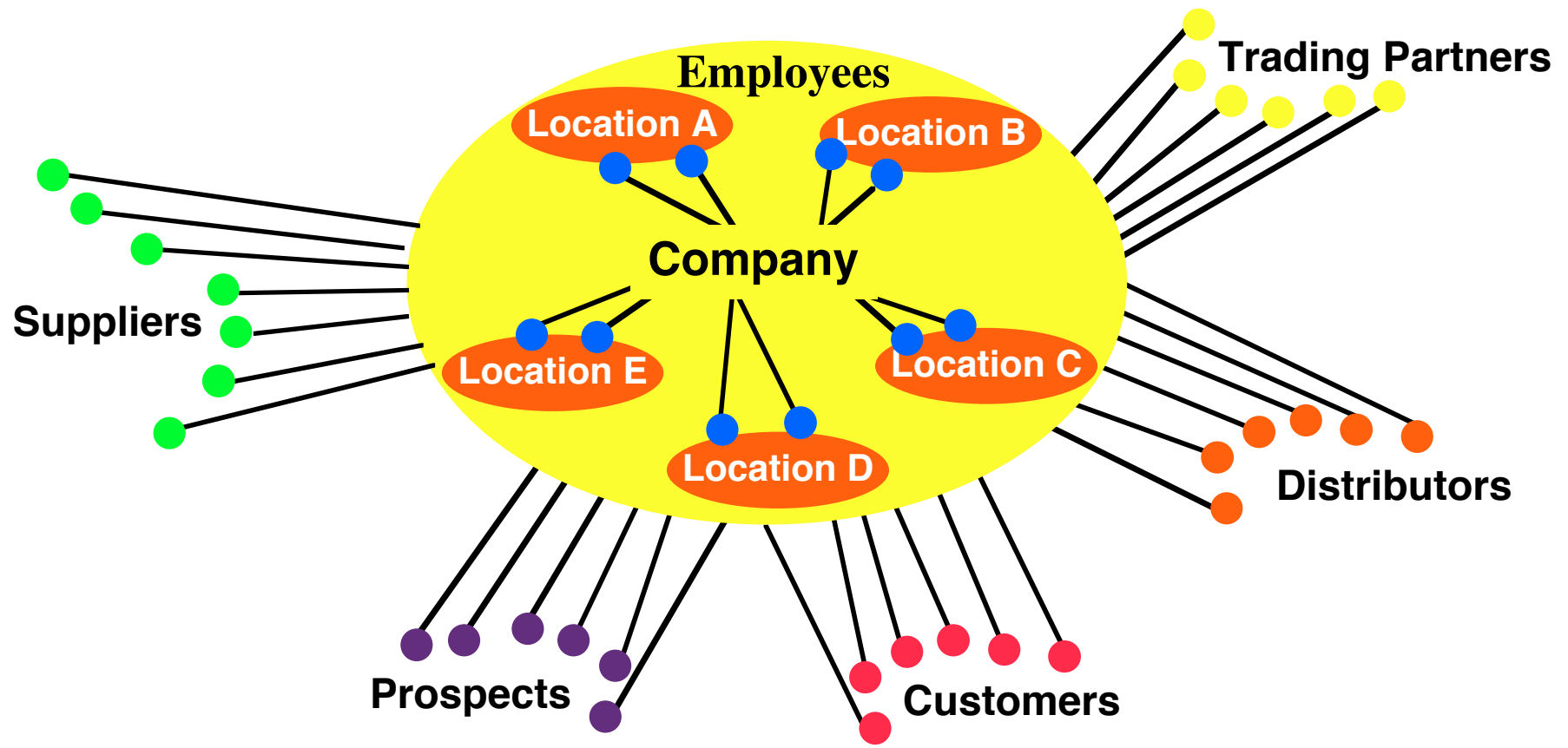








The Internet Present: Linking A Community of Interest





The Internet Present: Business Case

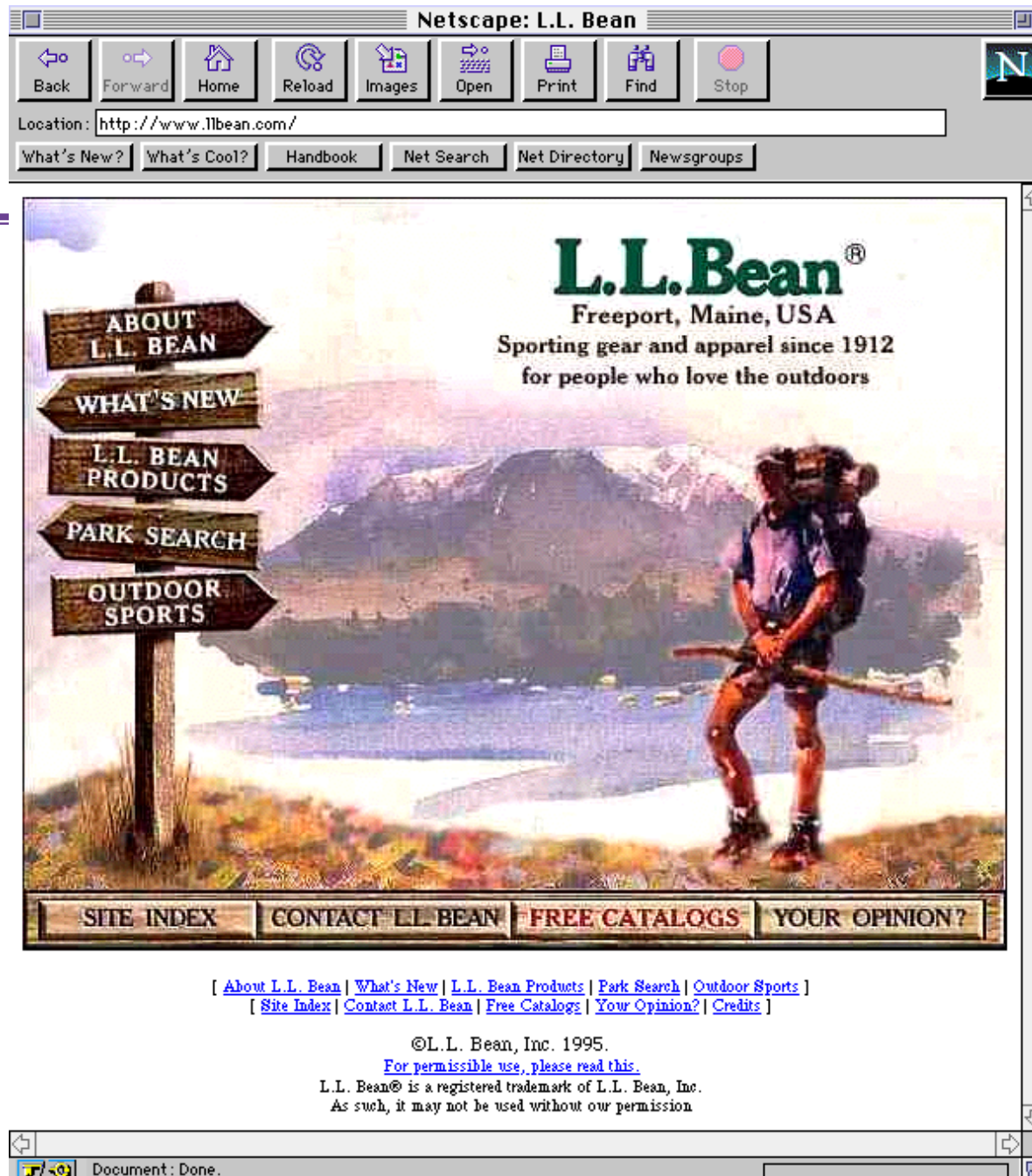
- u **Businesses Are Using the Internet to:**
 - u **Communicate and develop closer relationships with customers**
 - u **Build brand awareness and customer loyalty**
 - u **Improve customer satisfaction with faster response** —→
Part of the “Self-Service” trend
 - u **Reduce costs for customer support, telephone, fax and document distribution**



The Internet Present: An Emerging Electronic Marketplace

- u The Internet Is Becoming a Place Where People Meet to Exchange Information, Goods, Services, and Money - That Is, A Marketplace**
- u Early Adopters Are Starting to Use It to Publish Catalogs, Price Lists, Sales Promotions—and to Take Orders**







Netscape: Welcome to ISN

Back Forward Home Reload Images Open Print Find Stop

Netsite: <http://www6.internet.net/cgi-bin/getNode?node=1&&session=1962646>

ISN Internet Shopping Network

Visit Often - We're bringing you new savings and selections everyday!

	4 GB SCSI-2 DISK DRIVE \$699.⁹⁹		PACKARD BELL 486 SYSTEM \$799.⁹⁹		COLOR SCANNER \$299.⁹⁹
	\$49.⁹⁹		SNAPPY VIDEO GRABBER \$189.⁹⁵		28.8 INT FAX MODEM \$99.⁹⁵

Directory

 Specialty Stores	 Hot Deals	 Computer Goods
ISN Photo Video	Windows 95 Products	Apple Products
FTD Flowers	4GB SCSI-2 Hard Drive	CD-ROMs
Global Plaza	Vectorman	Demos
Hammacher	Packard Bell 486	Disk Drives
Schlemmer	Snappy Video Grabber	Downloadable Software
Hilyard & Hilquist	Color Scanner	Games
Omaha Steaks	28.8 Int Fax	Hot Deals
The Right Start	Phantasmagoria	InfoWorld
Catalog	After Dark for Win'95	Master List
<i>Coming soon:</i>	QuickBooks Pro	Modems
Lillian Vernon	More Hot Deals	New Stuff
Children's Wear		Windows Products





Netscape: Specialty Stores


Back Forward Home Reload Images Open Print Find Stop


Netsite: <http://www6.internet.net/cgi-bin/getNode?node=20905&session=1962646>


Overview **Specialty Stores** **ISN**


The image for FTD Online shows a bouquet of flowers in a vase, with a yellow circular logo in the bottom right corner containing the letters "FTD".

The image for Hammacher Schlemmer features a large, stylized "HS" logo in black and white, with a red and white striped object below it.

The image for THE RIGHT START CATALOG shows a smiling young girl with dark hair, wearing a colorful patterned shirt.

The image for Global Plaza depicts a view of the Earth from space, showing the blue oceans and white clouds of the planet.

The image for Omaha Steaks shows a large, cooked steak on a plate, garnished with vegetables and a fork.

The image for Hilyard & Hilquist shows a variety of pizzas, including a whole pizza and several slices.

[FTD Online](#) | [Hammacher Schlemmer](#) | [The Right Start Catalog](#)

[Global Plaza](#) | [Omaha Steaks](#) | [Hillyard & Hillquest](#)





Crossing the Chasm to Electronic Commerce

Communications

Product Info

Advertising

News/Articles

Product Samples

FAQ's

Commerce

Financial Transactions

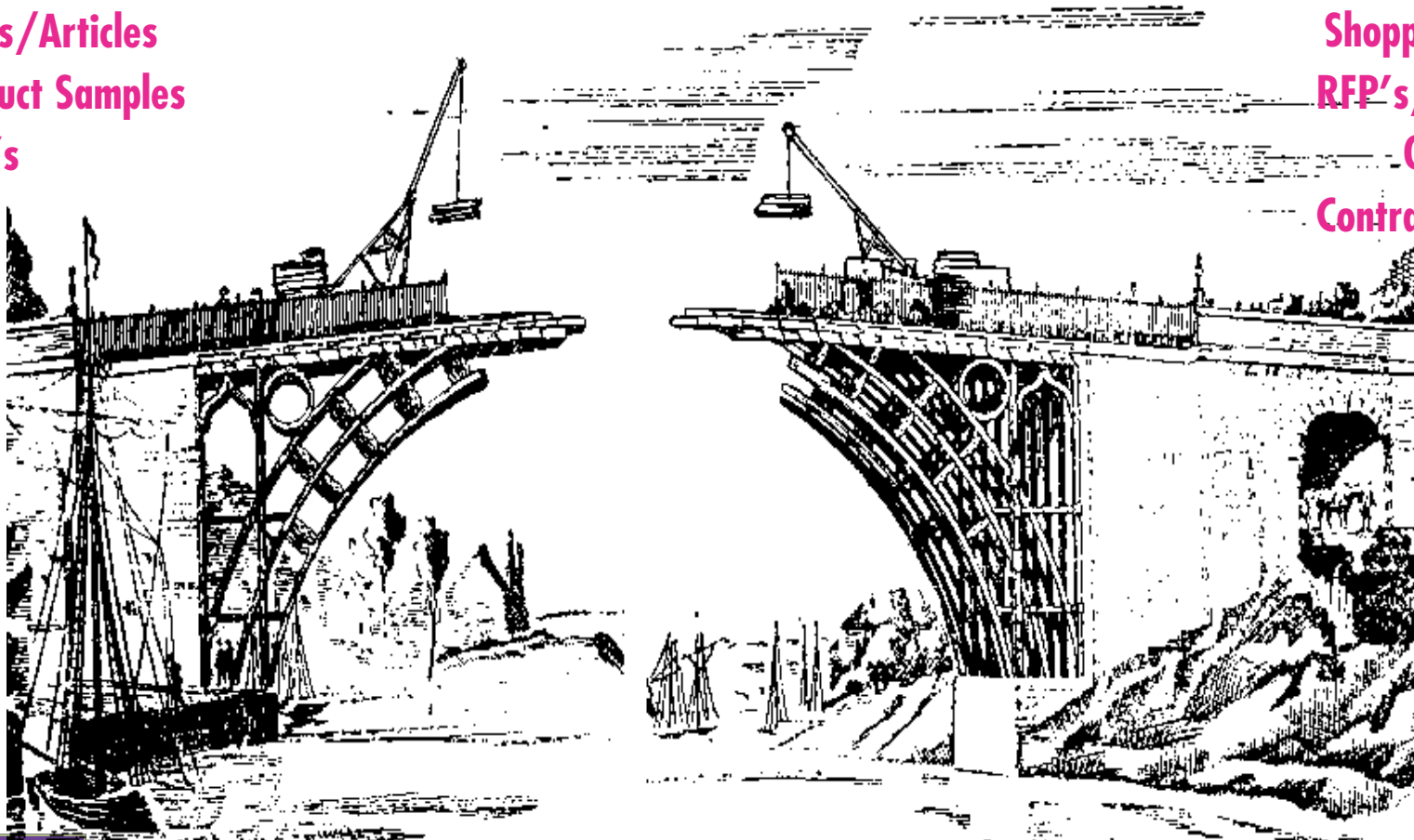
Buying and Selling

Shopping Agents

RFP's/Proposals

Order Entry

Contracts/P.O.'s



BBN Planet Corporation



Crossing the Chasm to Electronic Commerce

Communications

Product info

Advertising

News/Articles

Product Samples

FAQ's

Commerce

Financial Transactions

Buying and Selling

Shopping Agents

RFP's/Proposals

Order Entry

Contracts/P.O.'s

Challenges

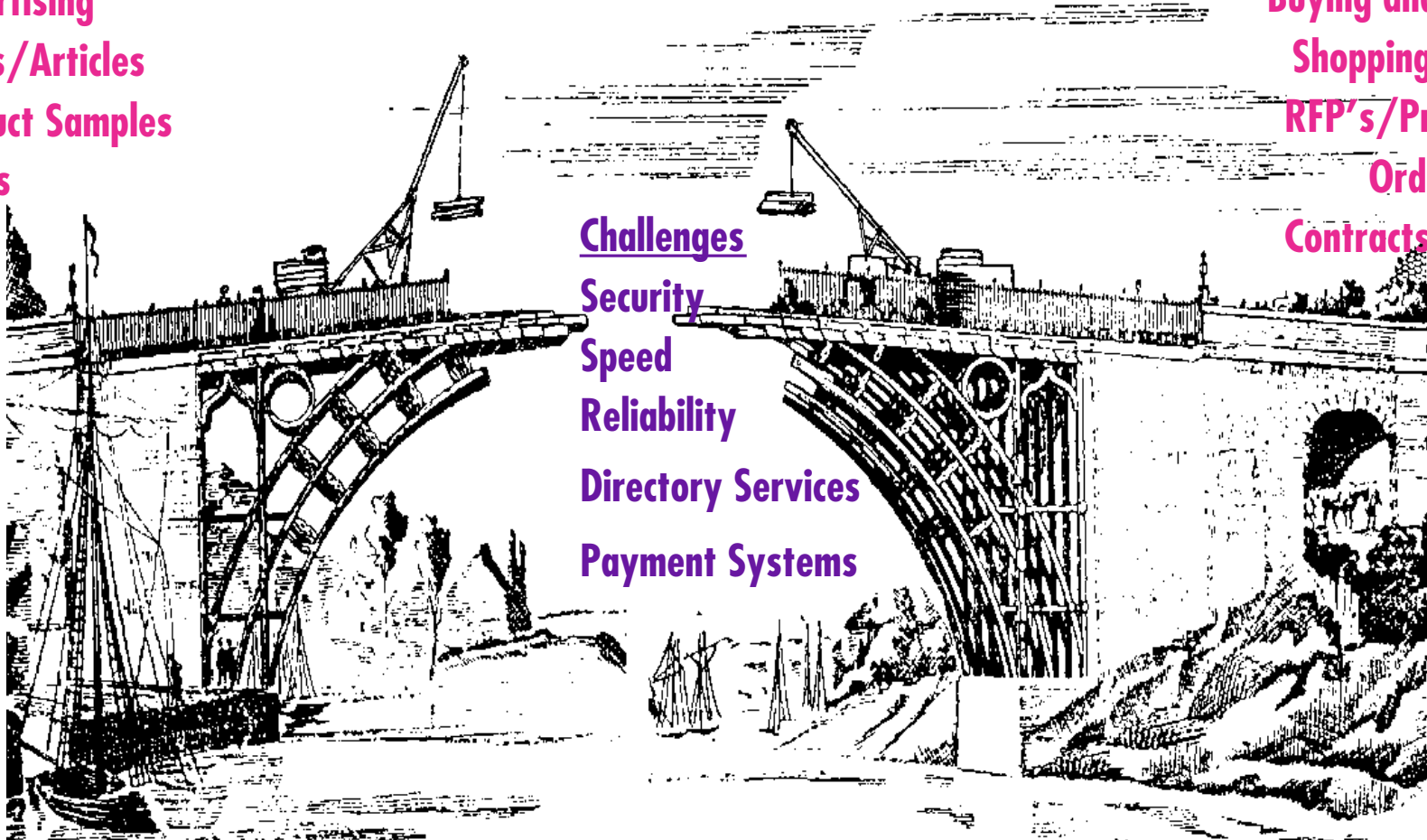
Security

Speed

Reliability

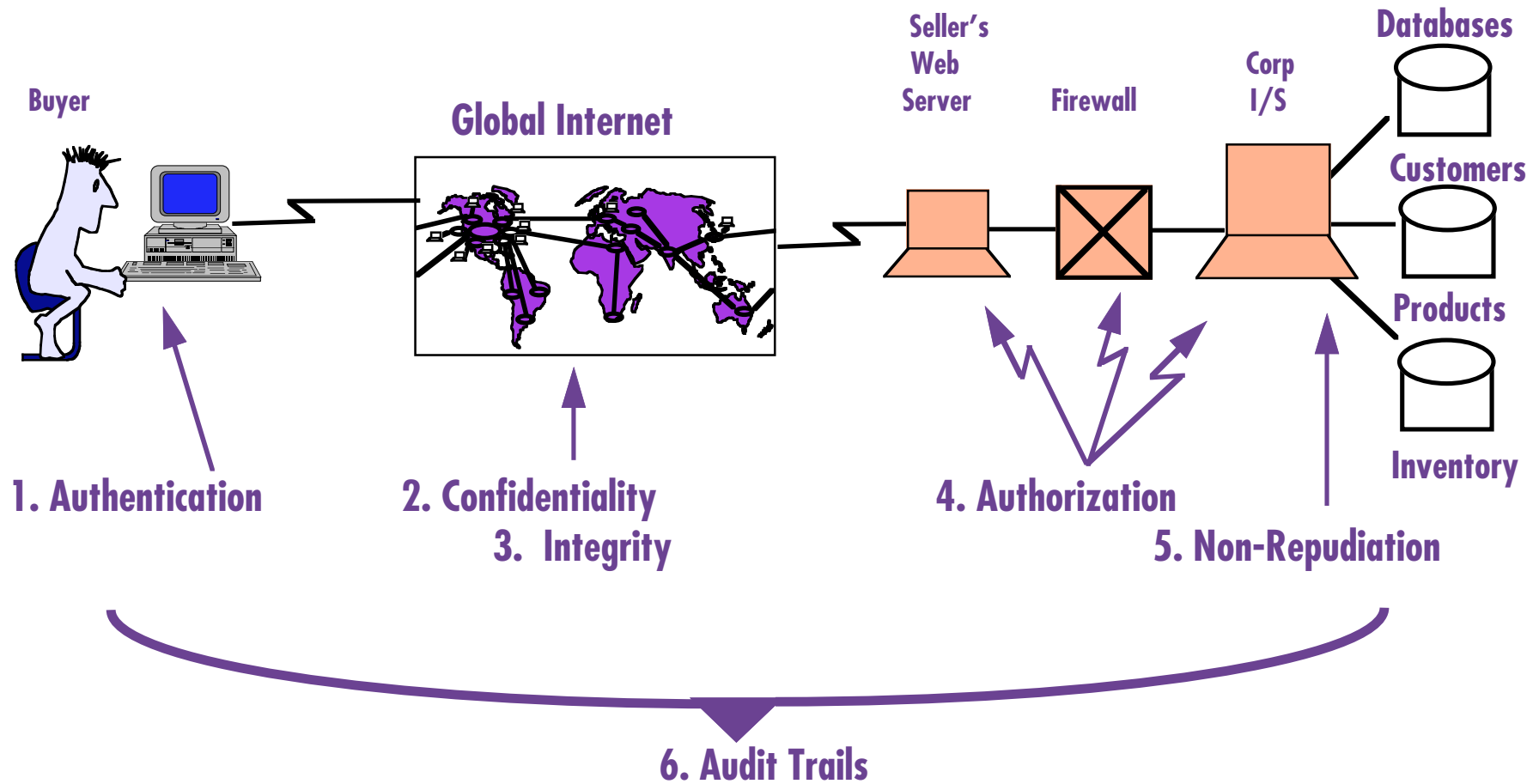
Directory Services

Payment Systems





Internet Security Issues





The Internet Industry is Developing Security Solutions...



Electronic Commerce Forum

Netscape: Servers/Browsers

RSA: Encryption Algorithms

Open Market: Merchant Servers

FSTC: Electronic Checking

DigiCash: Electronic Money

BBN Planet: Network Security Services

Cisco: Routers

Terisa Systems: S-HTTP-Toolkits & Licenses

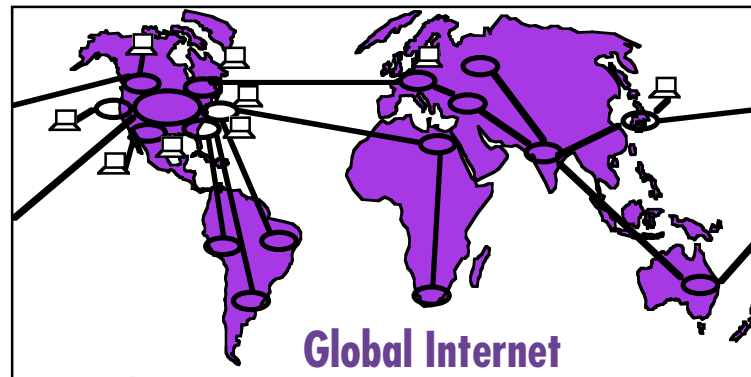
Trusted Information Systems: Firewall



Speed — Need for Faster Connections

ISDN
Broadband Cable

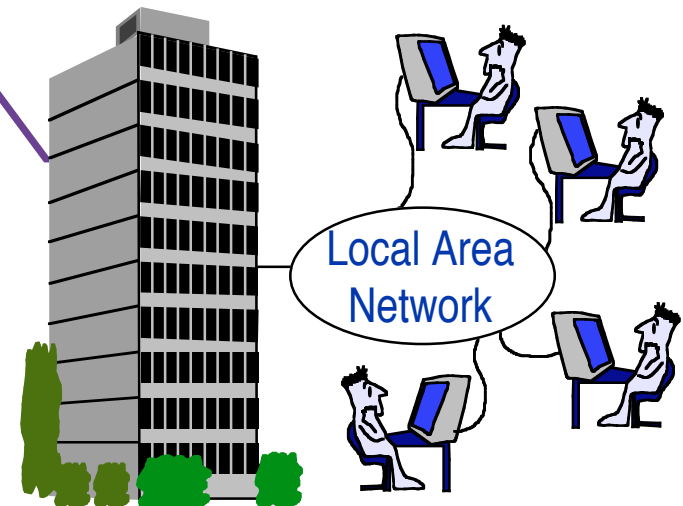
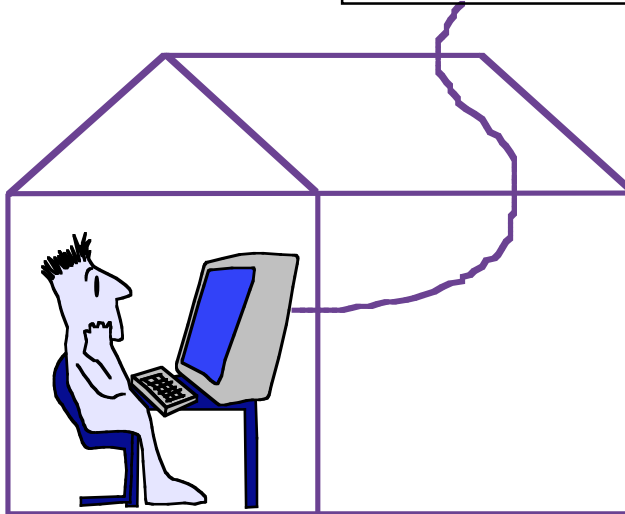
"Always on"



Reduced Latency

T-1 (1.5 Mbps)
+ Higher Speeds
for Multimedia
Commerce Servers

"No busy signals"



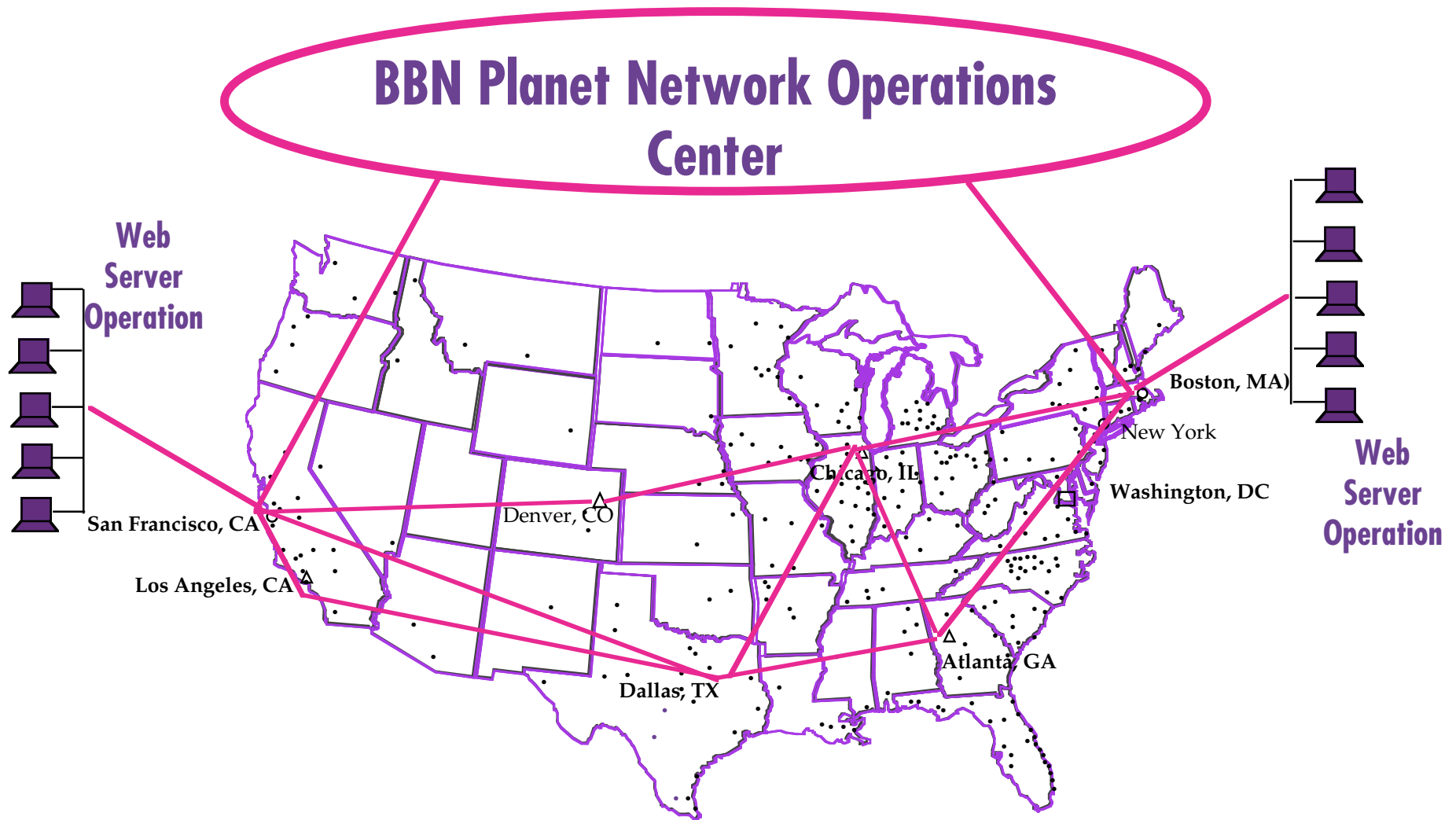


Reliability

- u **Network Connection: Improved end-to-end network management, Network Redundancy**
- u **Web Site Server Availability: Higher throughput, Mirrored Sites, Backups, Systems Management**
- u **Transaction Processing: Systems maturity, Audit Trails**



Nationwide Network Infrastructure (with AT&T)





Directory Services and Payment Systems

Today

How Do I Find You?

Find & Input

<http://www...com/>

How Do I Pay You?

Papers & Forms

Credit
Card

Paper
Checks

Card #
Exp. Date

Future

vs.

Point & Click; Voice Input

American Airlines

vs.

Electronic Wallet

\$ Electronic Cash

Electronic Checks

Electronic Credit Cards



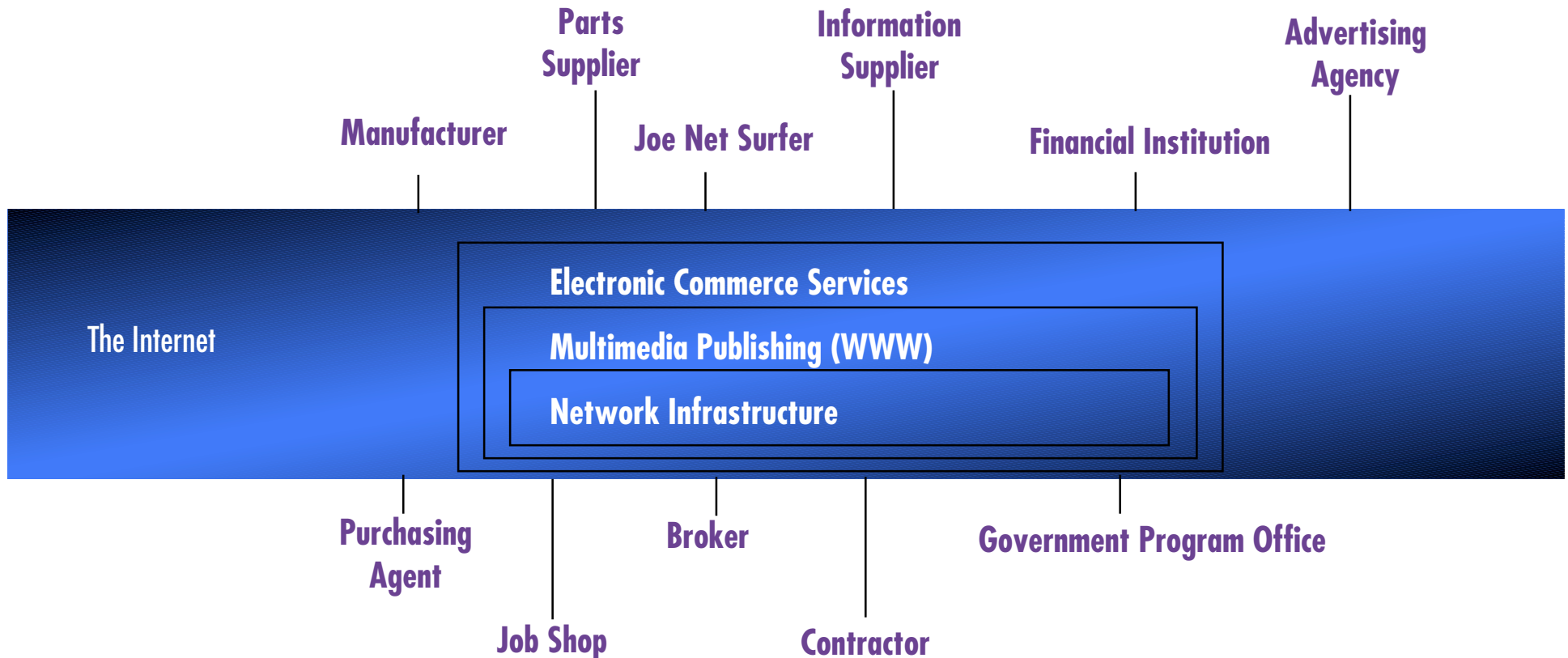
The Internet Future: A Multi-Purpose Network

Industry Markets

Business Functions:	Manu- facturing	Financial Services	Retail	Software	Legal	Health Care	etc.
Advertising							
Selling							
Customer Service							
Engineering Collaboration							
Just-in-Time Supply							
Document Distribution							
Product Distribution							
E-Mail							
Video Conferencing							



The Internet Future—A Multi-Layered Communications & Commerce Backbone





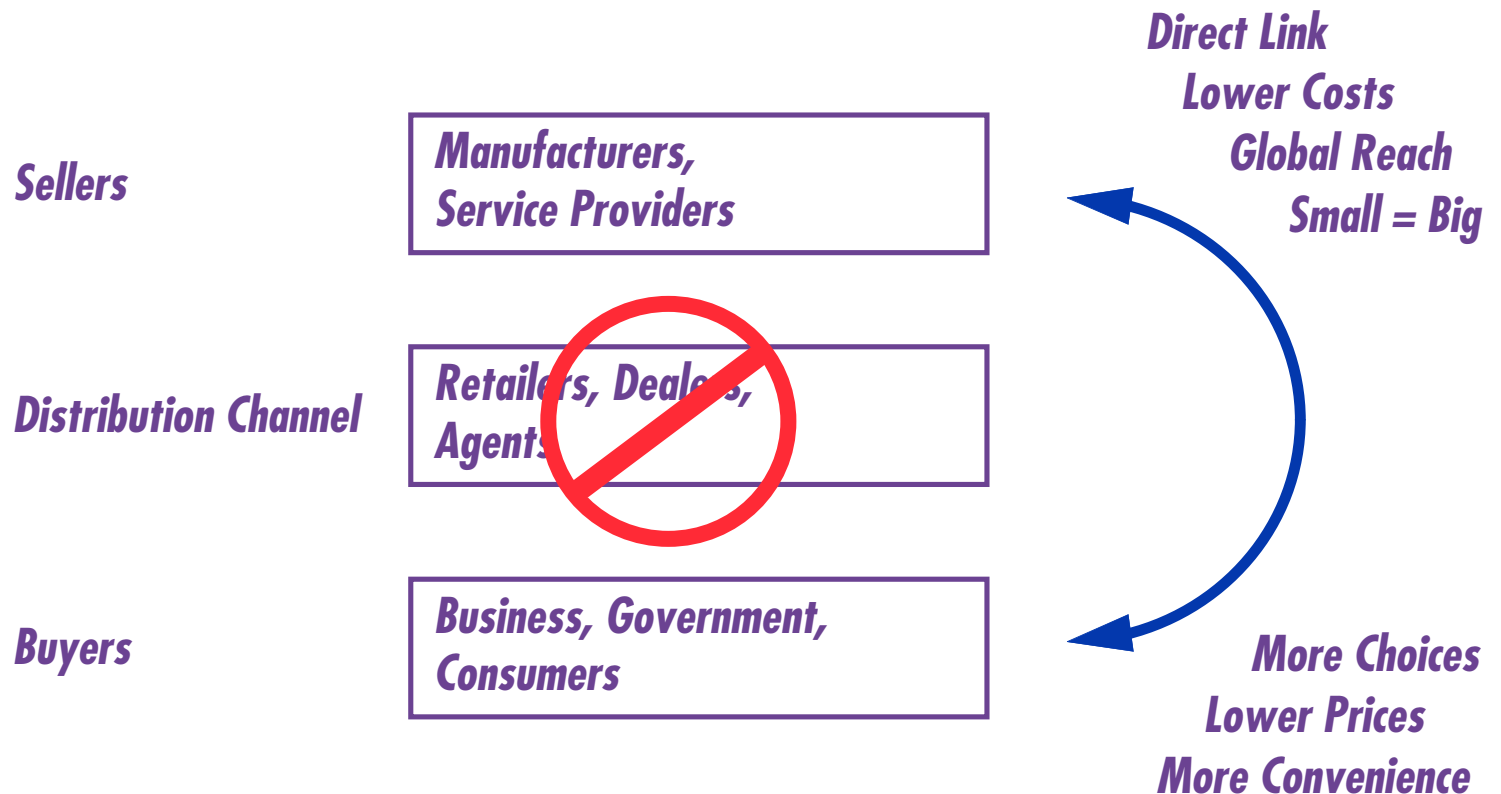
So What?

The Internet Becomes the Electronic Commerce Infrastructure of Choice:

- u Open
- u Easy to Connect
- u Standards-Based
- u Ubiquitous
- u Multi-Purpose



So What?





So What?

Sellers

*Manufacturers,
Service Providers*

*At the mercy of the
Electronic Channel*

Distribution Channel

*Retailers, Dealers,
Agents*

*Customer Intimacy
Electronic Shopping Agents*

Buyers

*Business, Government,
Consumers*

*More Choices
Lower Prices
More Convenience*





So What? Internet Impact Analysis



Upside

- More Revenue
- Global Reach
- Customer Links
- Lower Costs

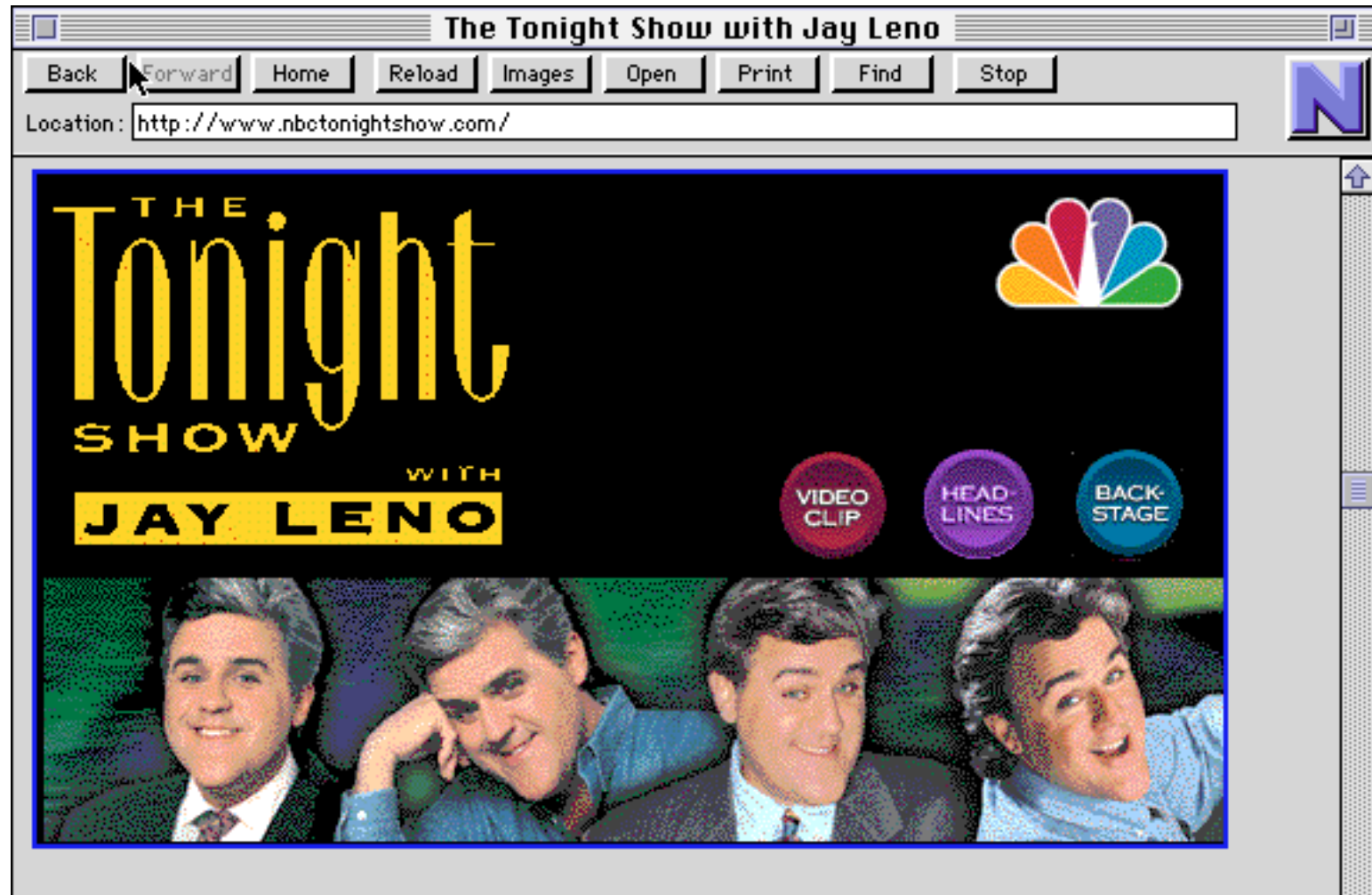
Downside

- Loss of Franchise
- Loss of Market Share
- New Competitors



Will it Cannibalize TV's Franchise?

Or, will it complement and extend the value of the Network's brand?





Will it Cannibalize TV's Franchise?

Or, will it complement and extend the value of the Network's brand?





What's the Impact on a News Channel?

Netscape: CNN Interactive

Back Forward Home Reload Images Open Print Find Stop

Netsite: <http://www.cnn.com/>

What's New? What's Cool? Handbook Net Search Net Directory Newsgroups

CNN interactive

U.S. NEWS	WORLD NEWS
BUSINESS	SPORTS
SHOWBIZ	POLITICS
WEATHER	TECHNOLOGY
FOOD & HEALTH	STYLE

Contents Search **Welcome Page** Help

October 31, 1995 -- updated 11:55 a.m. EST (1655 GMT)

Canada stays united but ...

Quebec vote is 'a wake up call'

October 31, 1995

Quebec separatists who wanted their Canadian province to become an independent country almost pulled it off, an indication to both separatists and federalists that a future split is still possible. By daylight Tuesday, Montreal police reported calm after overnight clashes, looting and arson that followed announcement of the final vote tally -- 50.6 percent "no" and 49.4 percent "yes."

[Full Story](#)

Referendum

Oui	49.4%
Non	50.6%

What You Think

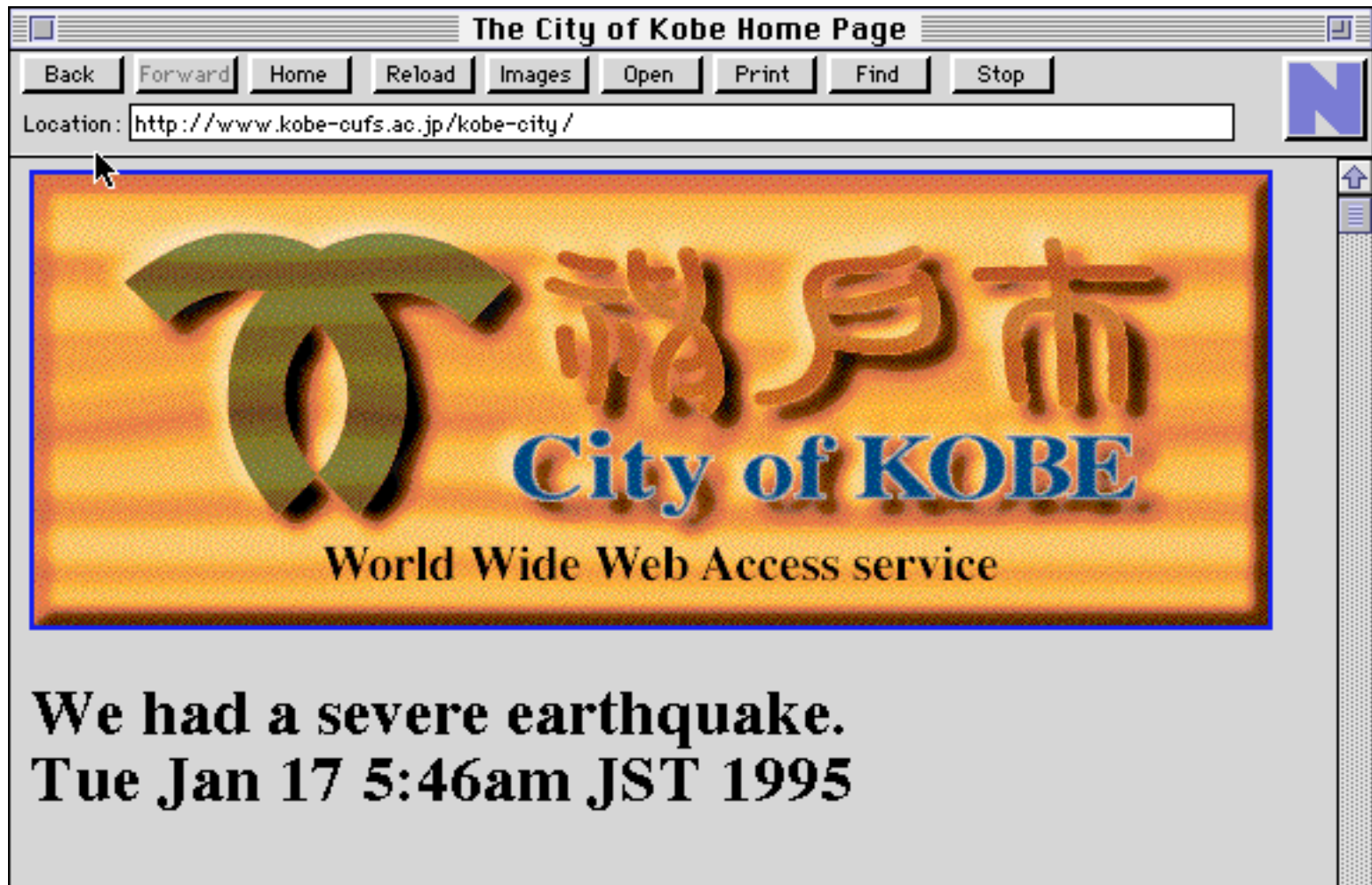
What is your reaction to the Quebec vote?

[Feedback](#): Please send us your comments.
[You said it](#) - some user comments.

http://www.cnn.com/MAPS/cnn_header.map?444,15

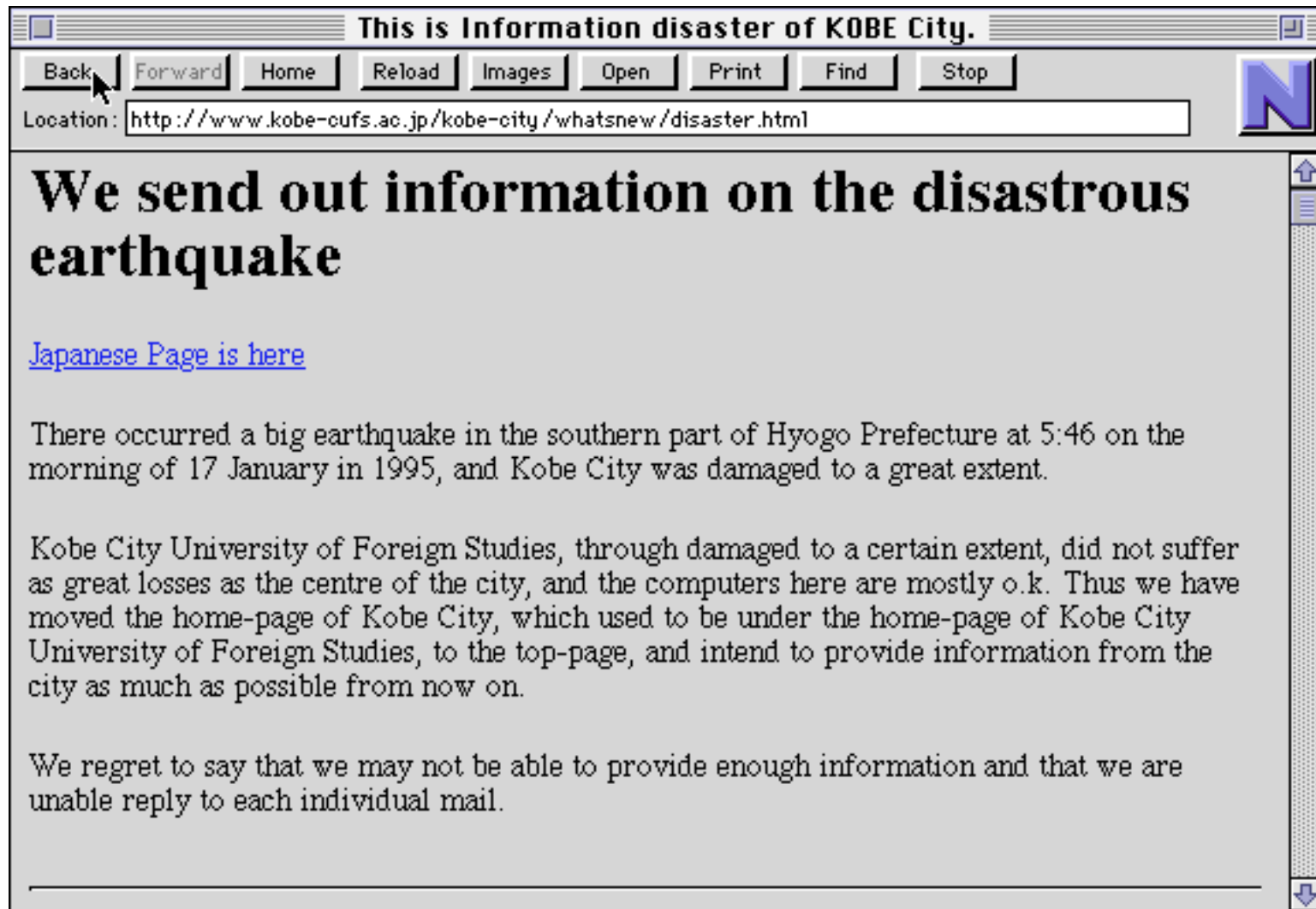


...If Anyone Can Broadcast the News Worldwide?





Kobe, Japan





Kobe, Japan





Mt. Ruapehu, New Zealand

Netscape: Mt Ruapehu - Live

Back Forward Home Reload Images Open Print Find Stop

Location: file:///Macintosh%20HD/Downloads/Paul's%20New%20Presentation/volcano.html

Mt Ruapehu - Live Action

Brought to you via Volcano-Cam



NetLink Wed Oct 18 10:15:59 1995

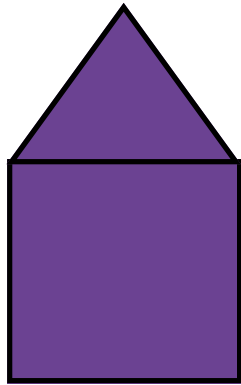
- [Best picture so far...](#)
- [Mt Ruapehu Information Centre...](#)
- [MPEG animations!](#)

Forecasted Volcano-Cam **view rating** over the next 24 hours = 2/10

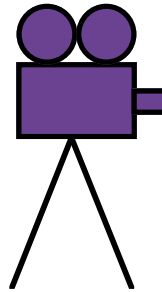


Two Models of the Network Television Industry

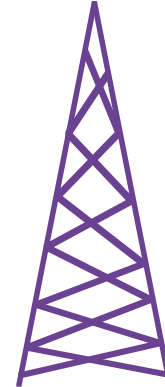
Old Model



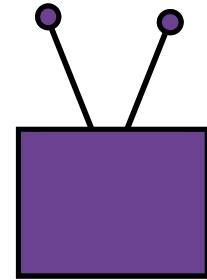
Expensive Studio



Expensive Gear

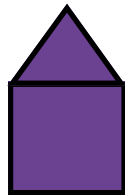


Limited, Regulated Distribution



Ubiquitous Device

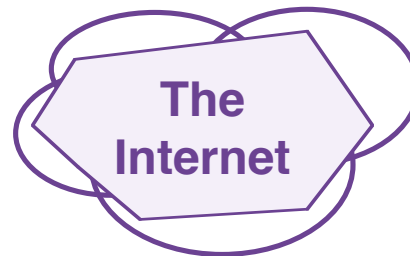
New Model?



Any Place



Cheap Camera



Unlimited, Unregulated Distribution



Ubiquitous Device



An Internet Industry Agenda

u Public Policy

- u Telecommunications Industry Regulation
- u Fair Competition
- u Electronic Commerce Laws
- u Security Standards
- u Redefining Personal Privacy
- u First Amendment Rights
- u Responsible Use

u Industry Commitment

- u Open Standards
- u Collaboration
- u Ease of Use
- u Creating Trust
- u Social Impact



Predictions From the Past . . .

"Housekeeping is such a simple matter when ordering is done over the wires. A morning's tiresome shopping can be done in 10 minutes, in the comfort of one's own boudoir. There is so much more time left for pleasure and recreation and things that are worthwhile."

Telephone Company Ad
Philadelphia, 1905



... and Forewarnings:

"We are getting perilously near the ideal of the modern Utopian, when life is to consist of sitting in armchairs and pressing a button. It is not a desireable prospect; we shall have no wants, no ambition, no youth, no desires, no individuality, no names and nothing wise about us."

British Journal , 1892



It's A "People Thing"—

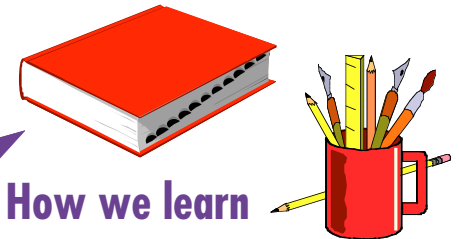
The Internet Will Affect . . .



How we develop
our relationships

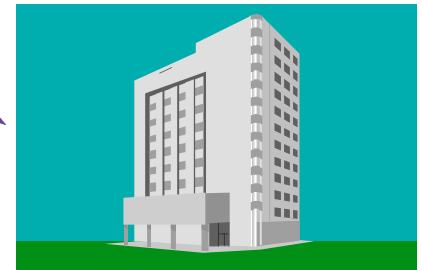


How we shop



How we learn

How we work



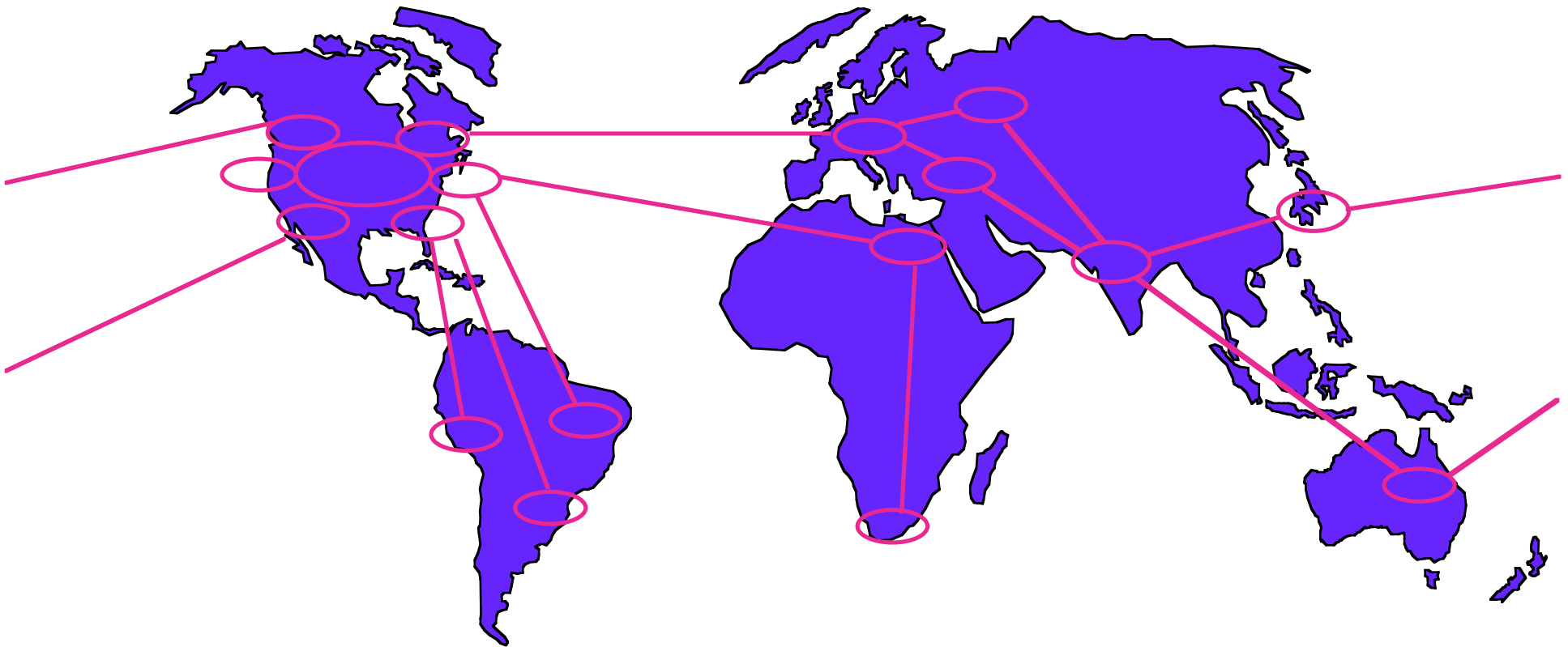
How we play





Planet

How Business Does Business on the Internet SM



End of Presentation

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Secure Communication and Commerce over the Internet

Amir Herzberg

Network Security Group

IBM – T. J. Watson Research Center

amir@watson.ibm.com

URL: <http://www.research.ibm.com/watson-netsec>



Network Security Group Directions:

- Internet Security
- Electronic-Commerce
- Secure Mobility (mobile-IP, CDPD, RF-LAN...)
- Cryptography and provable security
- Proactive Security (security recovers from break-in into servers, with proactive help from unbroken servers - attacker must break all/many servers together)



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Agenda

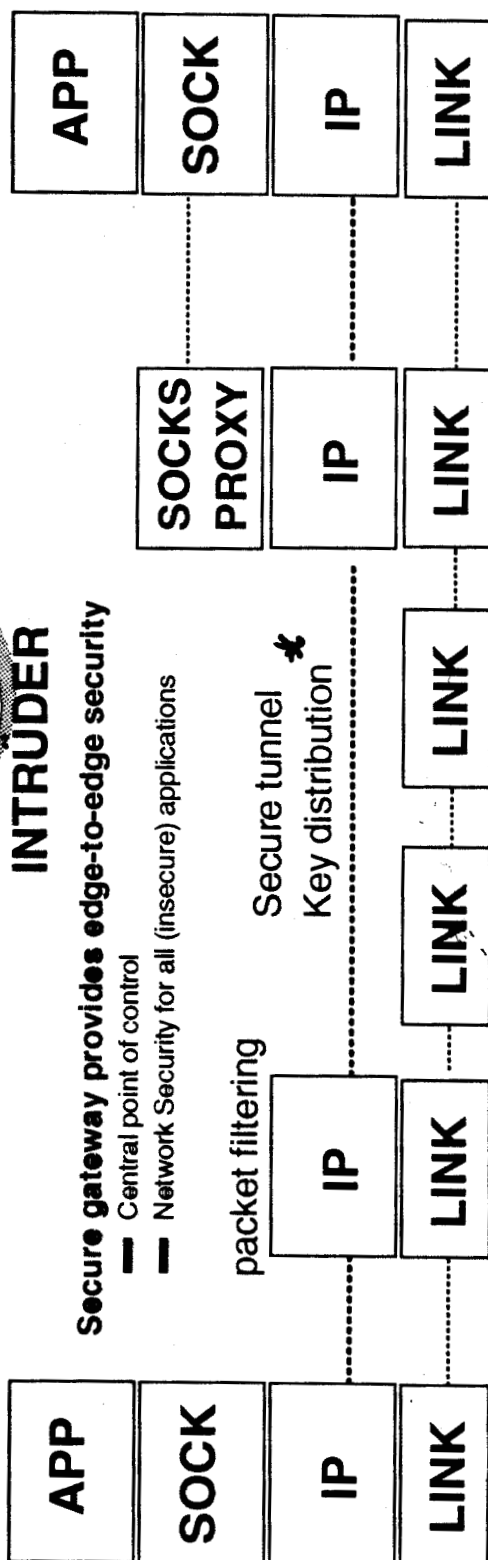
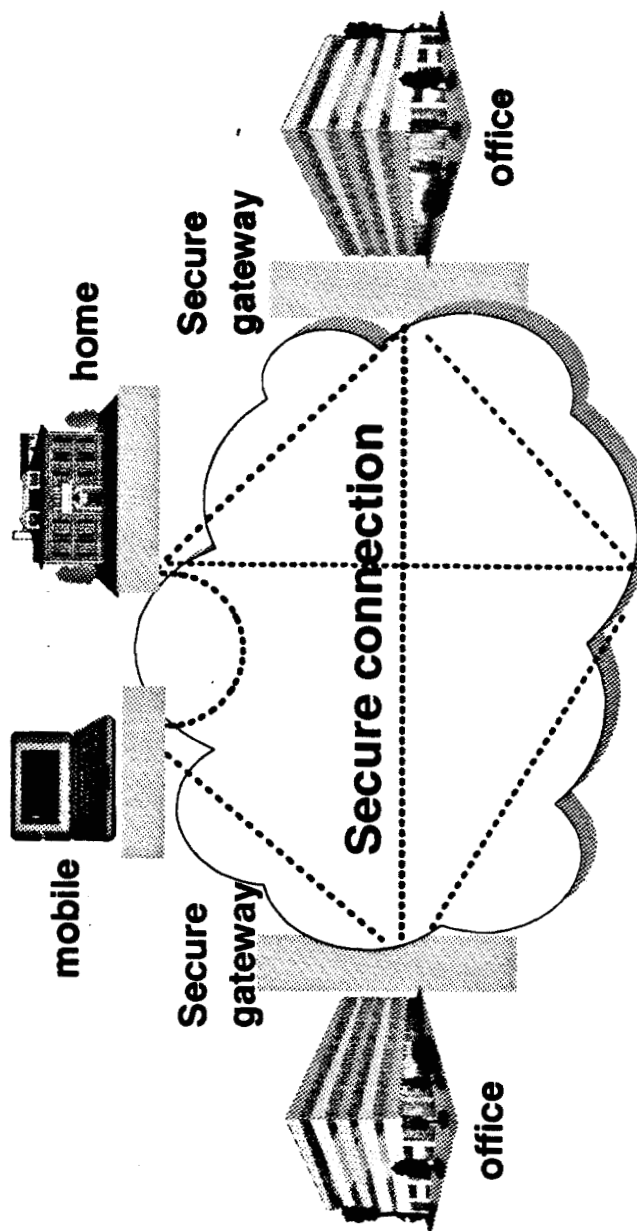
- Secure Communication across the Internet
 - What is the right layer?
 - Applications of IP layer security
 - Requirements for IP layer key management
 - High level design
 - Status
- Security for Electronic Commerce
 - Secure Payments - Model, Requirements
 - Proposals
 - SEPP - Secure Electronic Payments Protocol
 - Status
- Conclustions



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Internet Security

WHAT IS THE RIGHT LAYER?



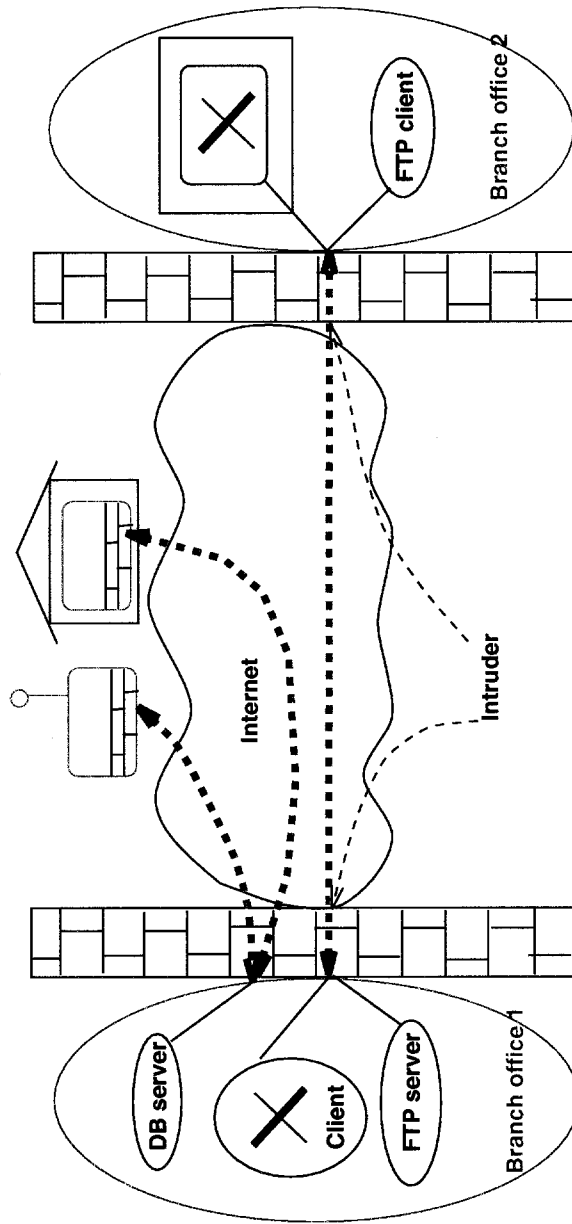
** NEED FOR STANDARD!*

Secure Communication Across Internet

- Secure IP tunnel over insecure Internet.
- Implement, establish Internet standards (IP-SEC WG)
- Session key distribution and refresh; data encryption, authentication, integrity.
- Allows public key or key distribution center (e.g. DCE, NetSP).
- Secure party-to-party communication
- Private virtual network over Internet
- Open, Secure, Efficient.



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- . IP secure tunnel over insecure Internet
- . Firewall-to-Firewall, Firewall-to-mobile, Firewall-to-Home
- . session key distribution, data encryption, authentication
- . Packet filtering at firewalls to block intruders.

IP Key Management Requirements

- Efficiency, Simplicity, Versatility, Scalability, Minimize Licensing
- High Security:
 - Trustworthy, conservative design
 - Modularity: replace broken pieces, allow tradeoffs / upgrades
 - Recovery from key exposure (by cryptanalysis or break-in) \Rightarrow forward secrecy, proactive security
 - Protect against denial of service (detect, prevent 'clogging')
 - Anonymity



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High Level Design

1. Anti-clogging defense: exchange 'cookies' (random numbers appended to all messages to identify source)
2. Key Sharing: use public keys (RSA) and cookie to authenticate a key
3. Authenticated Key Exchange (DH) for forward secrecy, proactive security
4. Key Refresh (against cryptoanalysis; detect denial of service)



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Status

- Proposed standard for packet encryption/authentication
- Key management: still converging... maybe 1H96?
- Good performance
- IBM available product: NetSP secure gateway
- Other interoperable products (from multiple vendors) coming



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Secure Electronic Commerce

- Internet as marketplace for electronic commerce.
- Security is a major concern.
- Secure payments - a critical enabler.
- Our goals:
 - Open market, standards, inter-operability.
 - Migration: allow gradual acceptance.
 - Long term - rich functionality.
 - Short term: Keep It Simple; 20/80 rule.
- Focus on charge cards: simple, common, extend existing system.



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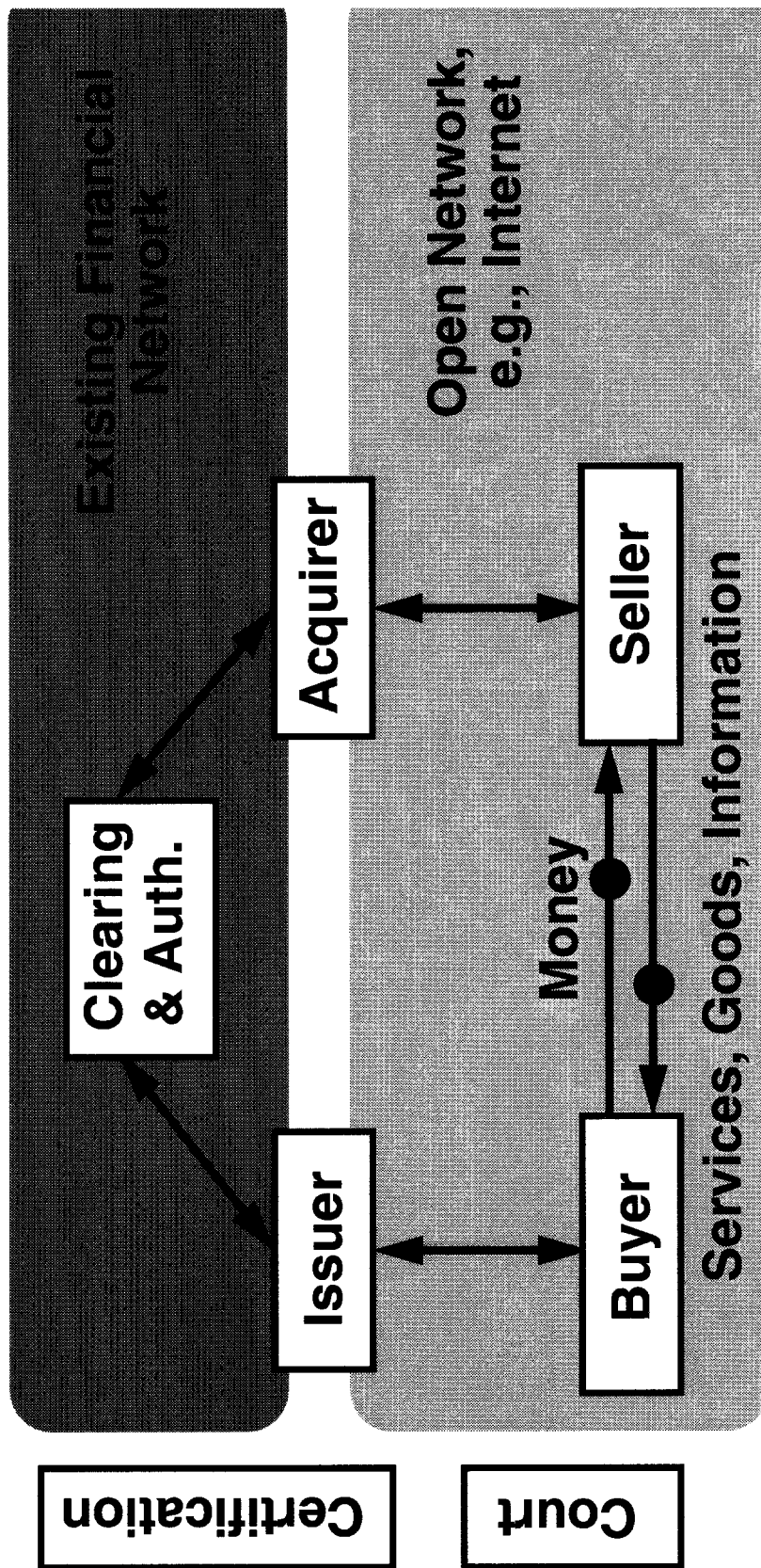
Electronic Payment Systems (partial list)

- General security schemes (SSL, SHTTP, secure E-mail, secure IP) - secure communication only, trust merchant, no non-repudiation.
- Non-cryptographic (First Virtual) - trust e-mail 'callback loop' and limit exposure
- Anonymous cash (DigiCash, CAFE) - more complex, impact on financial process, legal issues.
- Shared key crypto (SNPP, NetCheque, NetBill) - requires acquirer to cardholder relationship
- Public key crypto (STT, SEPP, iKP, CyberCash, Secure Courier)



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Secure Electronic Payment



SEPP vs. iKP

- SEPP uses 3KP (with minimal modifications)
- SEPP extends the iKP spec (e.g. certificates and implementation details)
- SEPP represents agreement on interoperable implementations among NetScape, CyberCash, GTE and IBM
- SEPP would be submitted to IETF (as soon as I-D formatting done)



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SEPP vs. STT (my personal opinion)

- Very similar goals and approach. Differences mainly due to design process: closed for STT vs. open for SEPP (IETF, WWWC, four vendors...)
- SEPP uses standards: ASN.1, X.509v3, ISO 8583, MIME
- Security: SEPP widely reviewed (esp. the core protocol - iKP); some concerns for STT
- SEPP is more efficient (4 vs 10 'hard' ops)
- STT requires licensing: RC4 and MS
- SEPP is web and e-mail, STT only e-mail
- SEPP contains enough details to implement.



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SEPP vs STT in short...

- Similar.
- Close vs open process.
- Standards
- Interoperability, 'devil in details'
- Efficiency
- Security
- Scope of spec



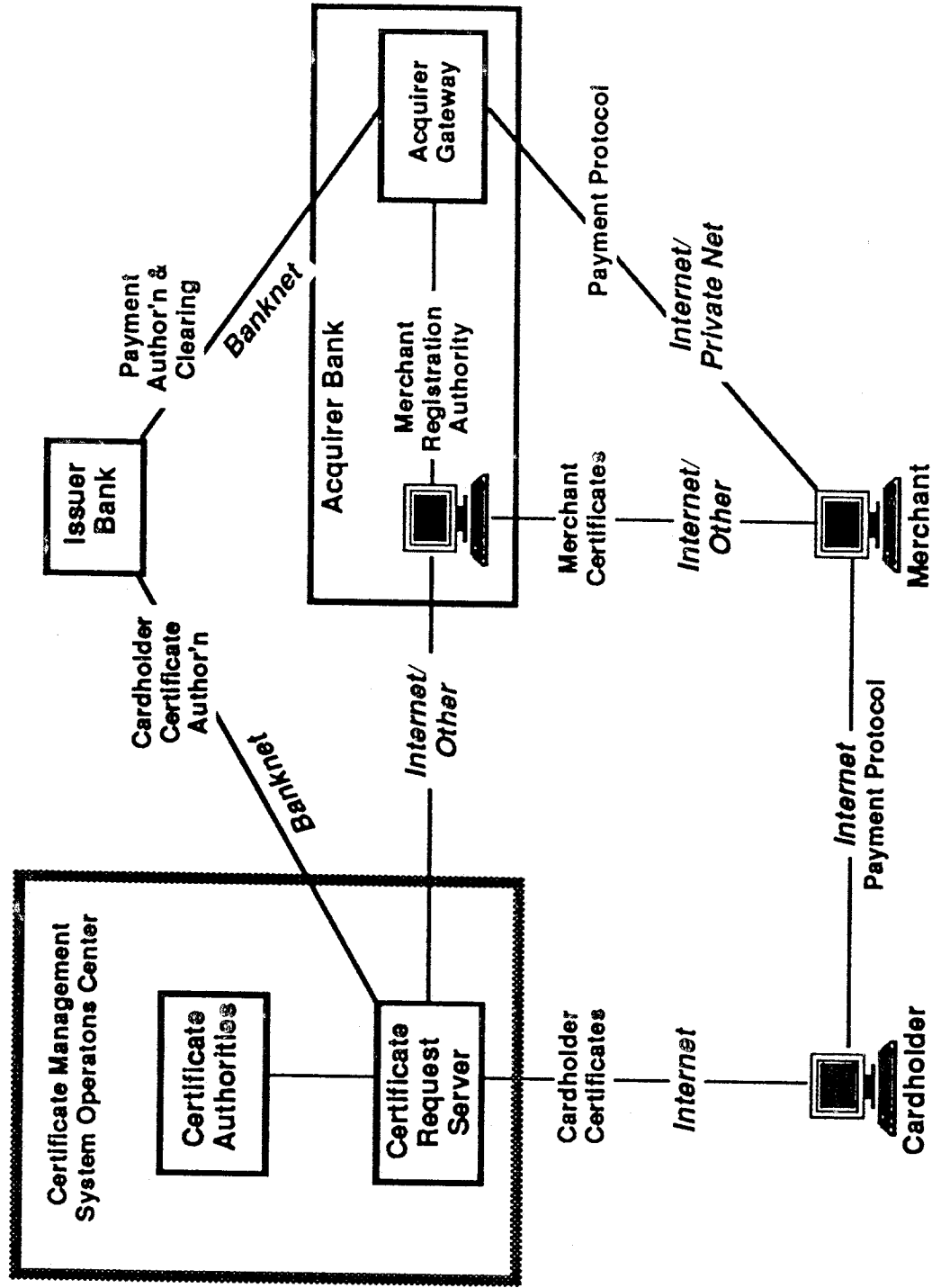
IBM Research

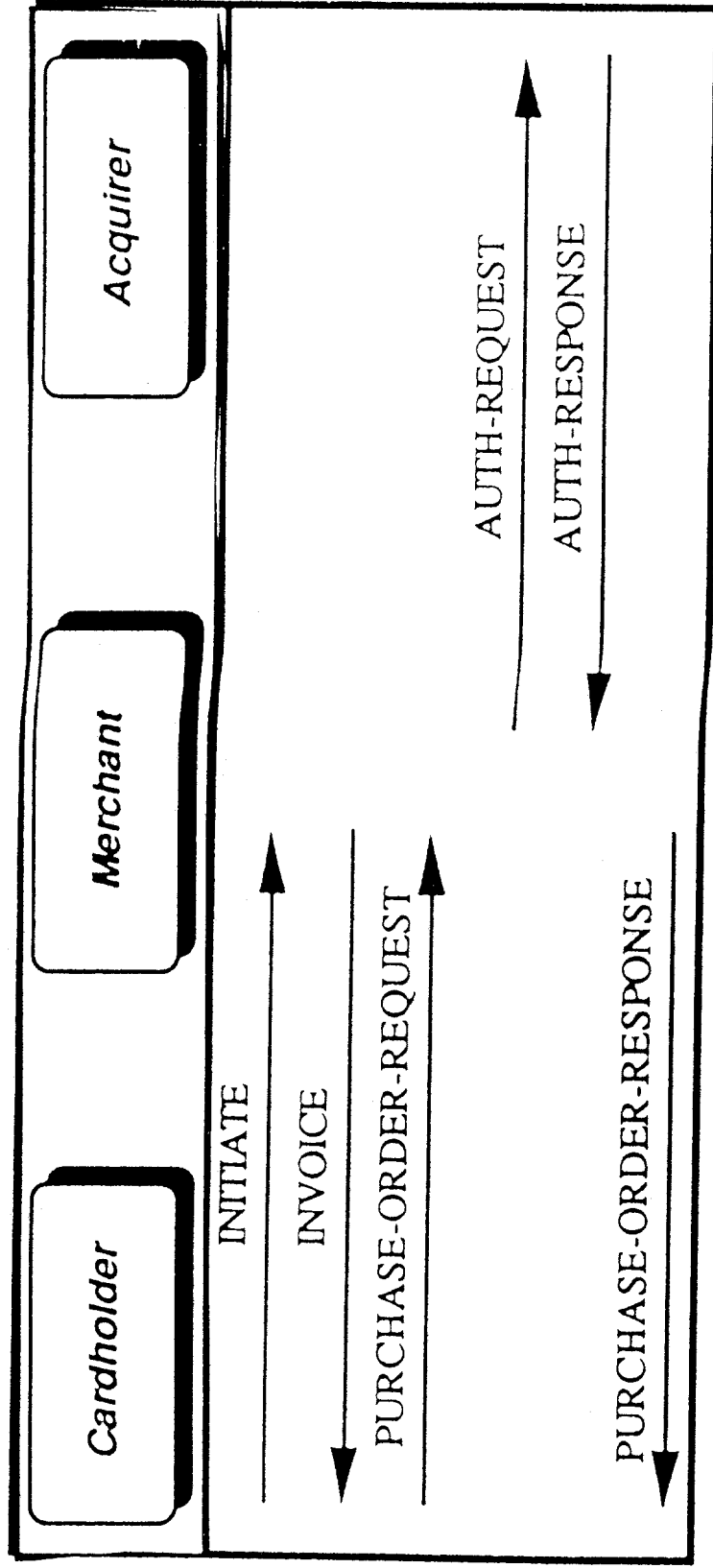
Elements of SEPP

- Payment protocol
- Certificate issuing and management
- Implementation over WWW and e-mail
- Interface to financial networks
- Error handling and disaster recovery



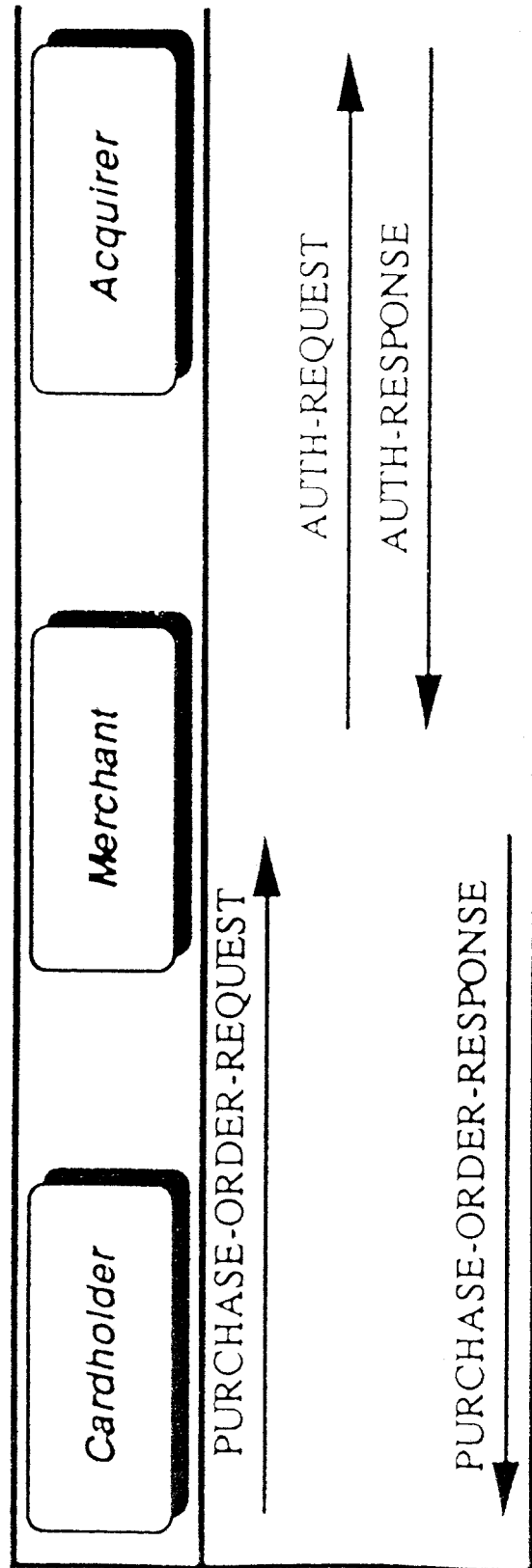
DRAFT - VERSION 1.1
Secure Electronic Payment Protocol





This is the basic purchase order message flow. The merchant may choose to perform "inline" authorization, as shown here, or delay authorization until some later time

Offline Purchase Order Flow

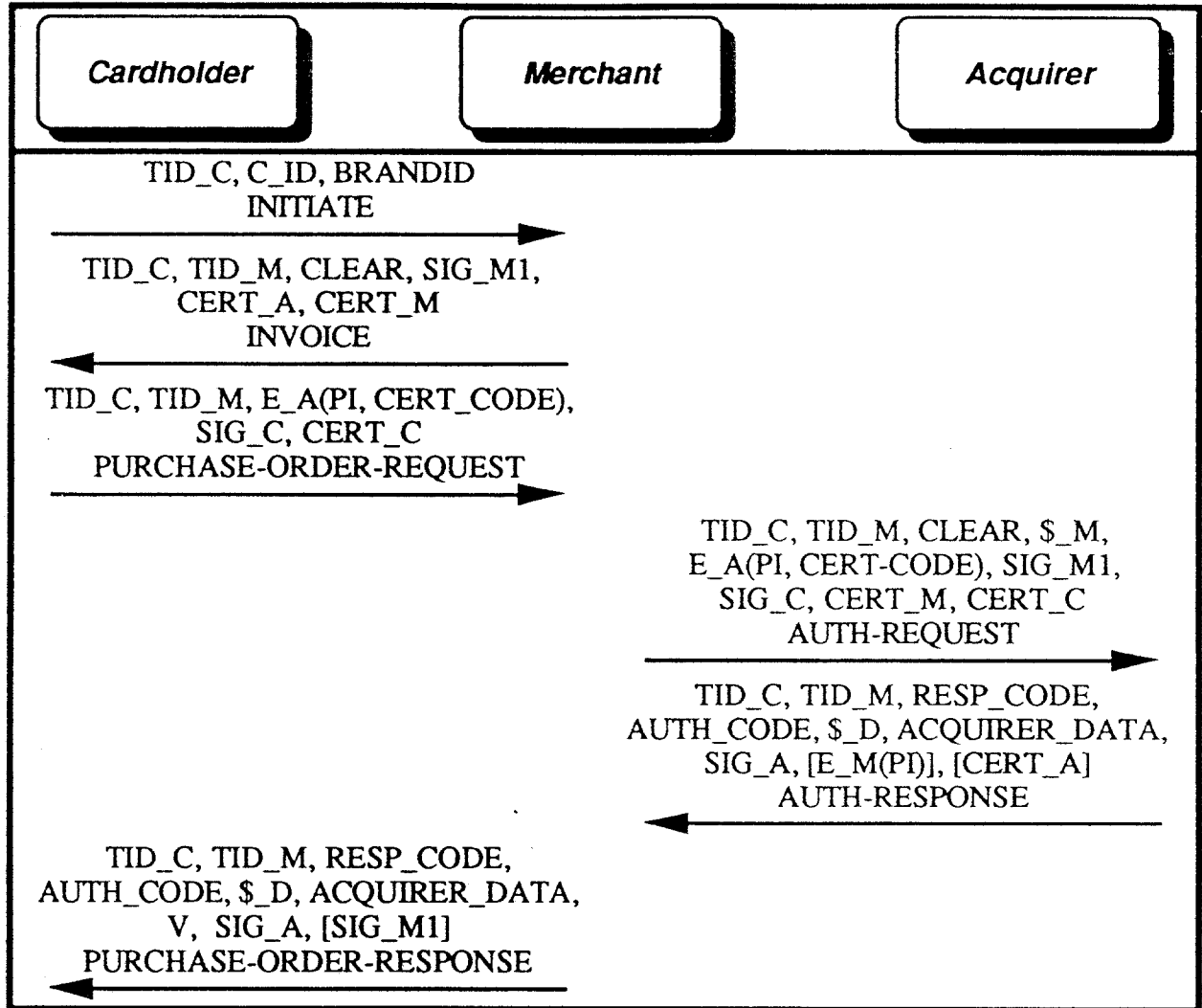


This is like the basic purchase order message flow, except that the INITIATE and INVOICE messages are omitted, and the PURCHASE-ORDER-REQUEST is accompanied by the Goods and Services Order, obtained from catalogs, CD-ROM, etc.

Composite Fields/Symbols

<i>Parameter</i>	<i>Definition</i>
COMMON	“information held in common by all parties” TID_C, TID_M, MFLAGS, \$\$, ID_M, DATE, NONCE_M, C_ID, H(GSO), H(V)
CLEAR	“information transmitted in the clear” MFLAGS, ID_M, DATE, NONCE_M, H(COMMON), H(GSO), H(V)
PI	“payment instructions” \$\$, H(COMMON), PAN, R_C, CARD_EXPIRATION, EXPIRE_DATE
SIG_M1	“merchant’s signature in INVOICE and AUTH-REQUEST” S_M(H(COMMON), H(CERT_A))
SIG_C	“cardholder’s signature” S_C(H(E_A(PI)), H(COMMON))
SIG_A	“acquirer’s signature” S_A(RESP_CODE, AUTH_CODE, S_D, ACQUIRER-DATA, H(COMMON))

**Purchase
Order with
Inline
Authorization
Flow**



SEPP over WWW

- Server sends an OFFER message marked
CONTENT-TYPE: APPLICATION/x-SEPP.
- OFFER message may be dealt by external
viewer (to allow 'snap-on' implementations).
- The OFFER message contains slightly-
modified-HTML form.
- This HTML form does not have embedded
info.
- New HTML tag: <PAYORDER>
- New attribute PAYINFO=VALUE



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HTML Forms Additions

<i>Value</i>	<i>Description</i>	<i>Provided by</i>
CCNAME	Credit card type	Cardholder
CCNUMBER	Credit card number	Cardholder
EXPMONTH	Month of expiration	Cardholder
EXPYEAR	Year of expiration	Cardholder
CERTCODE	Certificate Salt Value	Cardholder
R_C	Cardholder Random Number	Cardholder
TID_C	Cardholder Transaction Id	Cardholder
SHIPTO	Ship to Address	Cardholder
AMOUNT	Total amount	Merchant
CURRENCY	Currency of Amount	Merchant
CARDTYPES	List of Credit Card Brands Acceptable for Payment	Merchant
PIVALIDITY	Expiration Date of Payment	Merchant
URLPAY	URL for Payment Protocol	Merchant
URLSUCCESS	URL for Browser on Success	Merchant
URLFAILURE	URL for Browser on Failure	Merchant

SEPP over E-Mail

- Use when merchant and cardholder cannot interact (e.g. buying from CD-ROM when disconnected)
- SEPP messages are sent as a MIME types, marked by:
CONTENT-TYPE: APPLICATION/x-SEPP.
- INITIATE and INVOICE messages omitted



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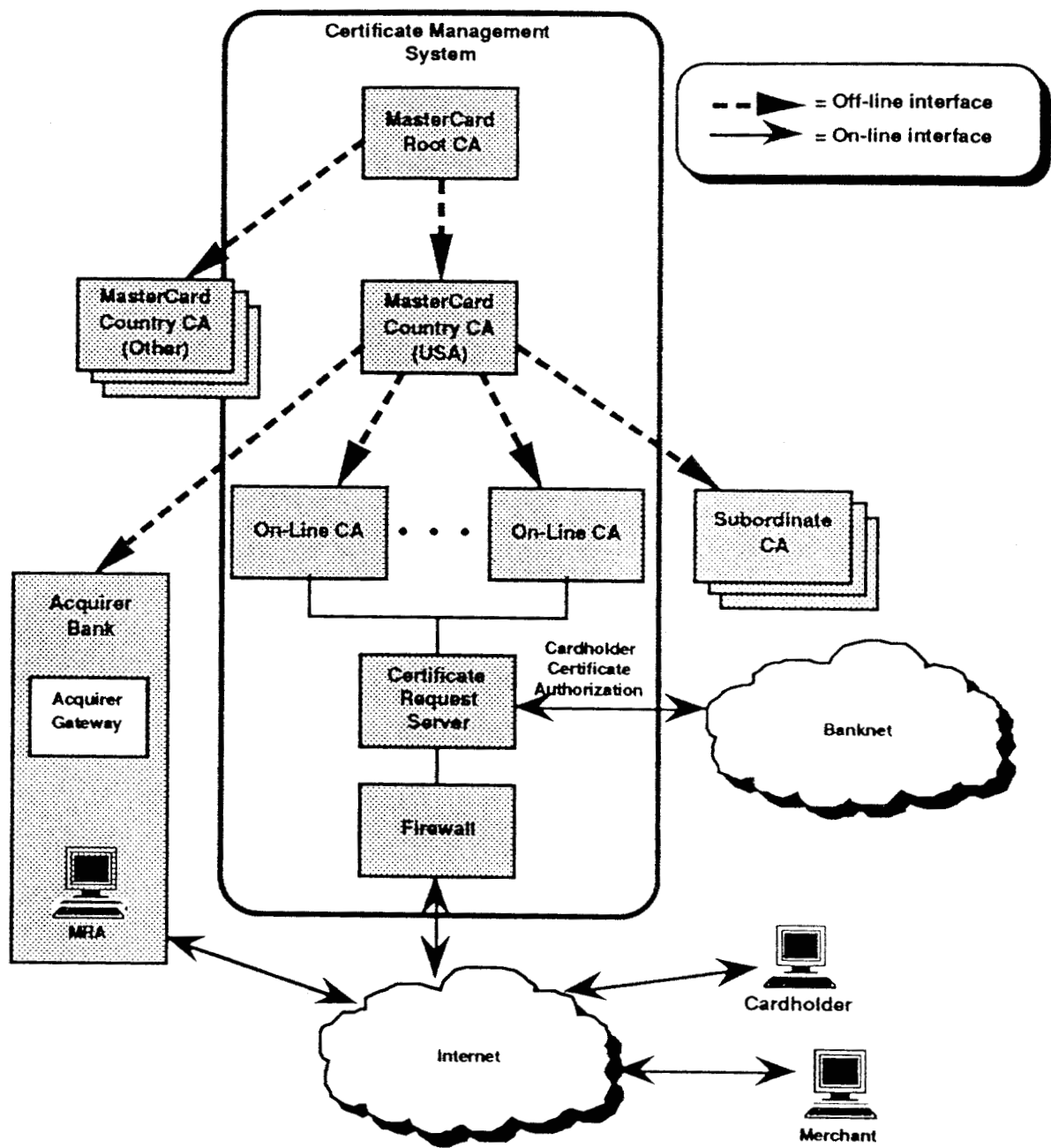


Figure 1. MasterCard Certificate Management System Architecture

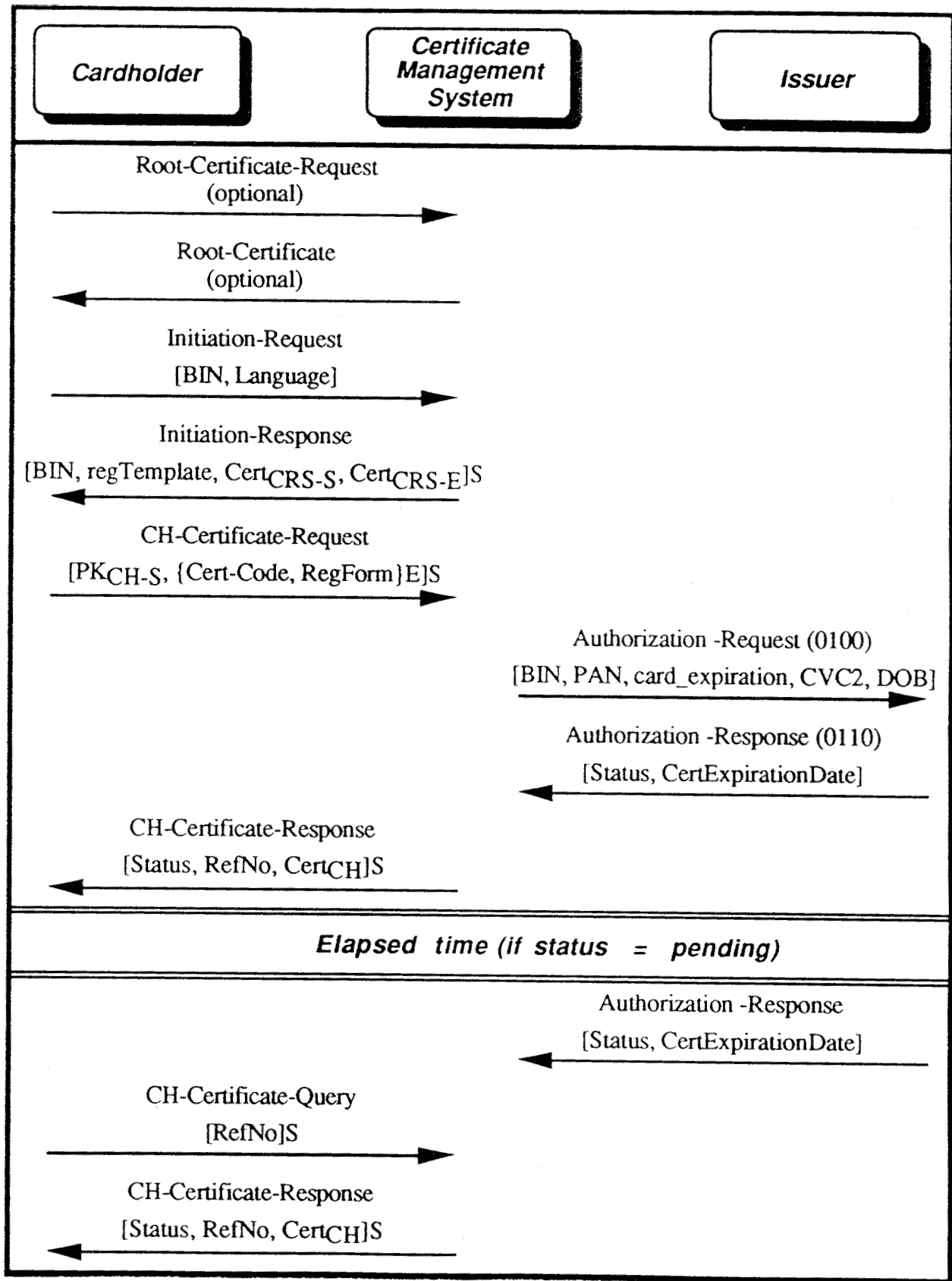


Figure 2. Detailed Cardholder Certificate Issuance Process

X.509 Certificate Field Name	Origin of data
Certificate.version	CA
Certificate.serialNumber	CA
Certificate.signature.algorithmIdentifier	CA
Certificate.issuer	CA
Certificate.validity	Issuer via Banknet Transaction Authorization response, or default value assigned by CA
Certificate.subject	CA
Certificate.subjectPubicKeyInfo	Cardholder
Certificate.issuerUniqueID	Reserved for future use.
Certificate.subjectUniqueID	Reserved for future use.
Extension.authorityKeyIdentifier	CA
Extension.KeyAttributes	Reserved for future use.
Extensions.certificatePolicies	CA
Extensions.keyUsageRestrictions	CA
Extensions.subjectAltName	Optional - cardholders e-mail address.
Extensions.subjectDirectoryAttributes	Reserved for future use.
Extensions.basicConstraints	CA
PrivateExtensions.brandID	Issuer via Banknet Transaction Authorization response, or default value assigned by CA
PrivateExtensions.accountValidationCode	CRS computes this value
PrivateExtensions.merchantAcquirerIDCode	Not applicable for cardholder certificates.
PrivateExtensions.certificateType	CRS sets to Cardholder
PrivateExtensions .merchantAuthorizationFlag	Not applicable for cardholder certificate requests (flag is not set).

Conclusions

- Convergence: now STT and SEPP; they will converge, too.
- SEPP advantages: open, free, scope (Web!), efficiency, security.
- IETF - open comments, convergence into standard
- For more info:
 - [HTTP://WWW.MASTERCARD.COM/SEPP/SEPPTOC.HTM](http://www.mastercard.com/SEPP/SEPPTOC.HTM)
 - [HTTP://WWW.WATSON.IBM.COM/XW-NETWORK-SECURITY](http://www.watson.ibm.com/XW-NETWORK-SECURITY)
 - sepp-talk@commerce.net, ietf-payments@cc.bellcore.com



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PURPOSE MATRIX

COMMUNITY OUTREACH ONLINE

Internet World
Boston, MA
November 1, 1995

Lisa Kimball
CEO, Metasystems Design Group, Inc.

PURPOSE MATRIX

Community Development	On-Line Discussion Groups
Information Generating Strategies	On-Line Questionnaire
Customized Information Products	Interactive Forms Access Database
More Complex Information Distribution	Hypertext Brochure
New Distribution for Same Old Stuff	Electronic Brochure

PURPOSE MATRIX

TELL ABOUT WHAT YOU'RE DOING USING OTHER MEDIA

DO SOMETHING NEW USING INTERNET - BASED TOOLS

PURPOSE MATRIX

TELL ABOUT

WHAT YOU'RE DOING USING OTHER MEDIA

USE INTERNET - BASED TOOLS

TO DO SOMETHING

NEW

PURPOSE MATRIX

“After six months, I realized that our planning committee was still arguing about the process for deciding which documents were going to be repackaged in HTML and we still didn’t have a web site!”

*- Executive Director of an Association
(which still has no web site)*

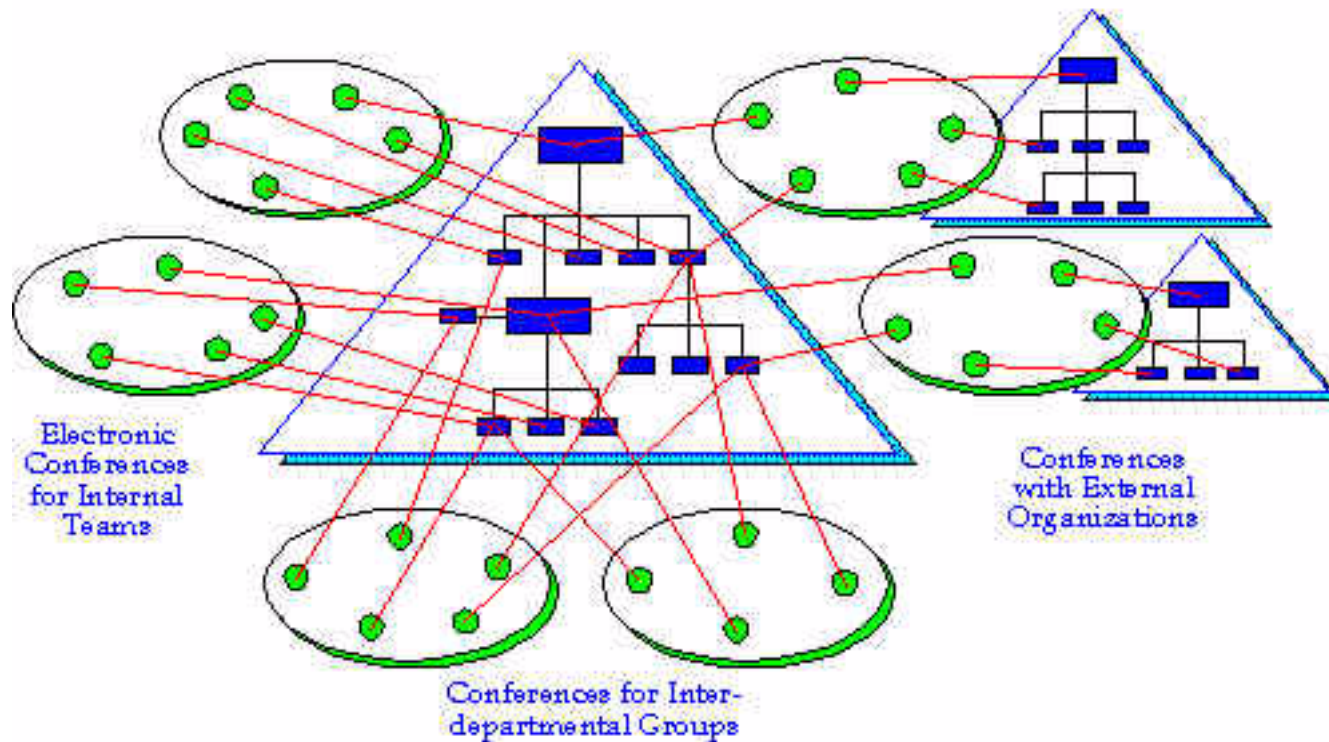
1. DO SOMETHING
2. LEARN FROM EXPERIENCE
3. DO SOMETHING DIFFERENT

PURPOSE MATRIX

	Disseminate Information	Implementation & Action
Known Constituents	Newsletter Back Issues Regional Contact Info Clipping Service	Task Forces Focus Groups Special Events
Public Unknown	Brochures Catalogues Press Releases	Letter Campaigns On-line registration Questionnaires

PURPOSE MATRIX

The Virtual Organization



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word

Issues. Culture. Cocktails.



sections



money



travel



machine



work



place



desire



habit

F E A T U R E S



SKATEBOARD JUNGLE BY MARC YANKUS



the
Stevie Nicks
experience

by

James Servin

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XI. LEGAL RESOURCES

ON-LINE SOURCES

Center for Democracy and Technology

WWW URL: <http://www.cdt.org/>

Electronic Privacy Information Center

Internet: epic@cpsr.org

Electronic Frontier Foundation (EFF)

Internet: eff@eff.org

FCC Law Journal

WWW URL: <http://www.law.indiana.edu/fclj/fclj.html>

High Technology Law Journal

WWW URL: <http://server.berkeley.edu/HTLJ/>

Legal Information Institute

WWW URL: <http://www.law.cornell.edu/>

Richmond Journal of Law and Technology

WWW URL: <http://www.urich.edu/~jolt/>

Rutgers University Newark Ackerson Law Library

WWW URL: <http://www.rutgers.edu/lawschool.html/>

The Journal of Online Law

WWW URL: <http://www.law.cornell.edu/jol/jol.table.html>

The Legal Domain Network

WWW URL: <http://www.kentlaw.edu/lawnet/lawnet.html>

Villanova Center for Information Law and Policy

WWW URL: <http://ming.law.vill.edu/VCILP.html>

Yahoo—Law

WWW URL: <http://www.yahoo.com/law/>

BOOKS

Access to and Use and Disclosure of Electronic Mail on Company Computer Systems: A Tool Kit for Formulating Your Company's Policy, David R. Johnson and John Podesta, The Electronic Messaging Association, 1994

Cyberspace and the Law: Your Rights and Duties in the On-line World, Edward A. Cavazos and Gavino Morin, MIT Press, 1994

Law of Electronic Commerce, Benjamin Wright, Little, Brown & Co., 1992

Netlaw: Your Rights in the Online World, Lance Rose, Osborne McGraw-Hill, 1995

LAW REVIEW ARTICLES

Becker, Loftus E. Jr. "The Liability of Computer Bulletin Board Operators for Defamation Posted by Others," 22 Conn. L.Rev. 203 (1989)

Branscomb, Anne W., "Internet Babylon? Does the Carnegie Mellon Study of Pornography on the Information Superhighway Reveal a Threat to the Stability of Society?," 83 Geo. L.J. 1850 (1995)

Hardy, Trotter, "The Proper Legal Regime for Cyberspace," 55 U. Pitt. L.Rev. 993 (1994)

Johnson, David R. and Kevin A. Marks, "Mapping Electronic Data Communications onto Existing Legal Metaphors: Should We Let Our Conscience (and Our Contracts) Be Our Guide?," 38 Vill. L.Rev. 487 (1993)

Naughton, Edward J., "Is Cyberspace a Public Forum? Computer Bulletin Boards, Free Speech and State Action," 81 Geo. L.J. 409 (1992)

CASES

CompuServe, Inc. v. Patterson, 1995 LEXIS 7530 (S.D. Ohio 1995)

Stratton Oakmont, Inc. v. Prodigy Services Corp., 1995 N.Y. Misc. LEXIS 229 (S. Ct. Nassau Co. 1995)

Cubby, Inc. v. CompuServe, Inc., 776 F.Supp. 135 (S.D.N.Y. 1991)

Daniel v. Dow Jones & Company, Inc., 520 N.Y.S. 2d 334 (Civ. Ct. N.Y.C., N.Y.Co. 1987)

Playboy Enterprises, Inc. v. Frena, 839 F.Supp. 1552 (M.D. Fla. 1993)

Steve Jackson Games, Inc. v. U.S. Secret Service, 816 F.Supp. 432 (W.D. Texas 1993) *aff'd* 36 F.3d 457 (5th Cir. 1994)

United States v. LaMacchia, 871 F.Supp. 535 (D. Mass. 1994)

State of Oklahoma v. Davis, 891 P.2d 600 (1994) (CF-93-4859)

Sega Enterprises, Inc. v. Maphia, 30 U.S.P.Q.2d 1921 (N.D. Ca. 1994)

Stern v. Delphi Internet Services Corp., 626 N.Y. Supp. 2694 (1994)

United States v. Morris, 928 F.2d 504 (2d Cir. 1991)

United States v. Thomas, No. 94-20019-G (W.D. Tenn. 1994)

unpublished but some documents relevant to this case are available from the Electronic Frontier Foundation's home page on the World Wide Web at <http://www.eff.org>

CompuServe, Inc. v. Patterson, 1995 LEXIS 7530 (S.D. Ohio 1995)

CompuServe, Inc. v. Patterson, 1994 LEXIS 20352 (S.D. Ohio 1995)

STATUTES

Electronic Communications Privacy Act, 18 U.S.C. §2510, et seq.

Utah Digital Signature Act, Utah Code Annotated §46-3-101, et seq.

Computer Fraud and Abuse Act, 18 U.S.C. §1030, et seq.

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STRUCTURING STRATEGIC TRANSACTIONS

Wayne A. Martino, Esq.
Newton D. Brenner, Esq.
Brenner, Saltzman & Wallman
New Haven, Connecticut

I. DEFINITION

A Strategic Transaction is a collaborative relationship which helps each party leverage existing resources to achieve strategic business objectives and often involves the alignment of technological innovation, organizational resources, management expertise, entrepreneurial abilities and capital. Typically, these relationships are between large established corporations and smaller entrepreneurial or emerging growth companies with a technological advantage. Emerging companies generally find it difficult to obtain and commit the financial and human capital necessary to conduct the research and development activities necessary to develop products in order to maintain their technological advantage as well as to market them. Consequently, relationships with established companies with a strong market presence or distribution capacity may be advisable.

A company may enter into a strategic transaction with many different parties often with a parallel or complementary course of development. In addition, the technology or product generated from one relationship may have broader applications that may be used in other relationships.

II. CHOOSING A STRATEGIC PARTNER

Choosing a strategic partner is the most critical element of success. Both sides should objectively evaluate the following criteria in order to determine the likelihood of success:

1. **Compatibility of Goals.** Do the parties have compatible expectations and objectives? The business interest of either party may either reinforce the possibility of success or lead to future conflicts.
2. **Mutual Incentives.** Both parties must have an expectation of, and receive, significant benefit in order to have the proper incentive to maintain a collaborative relationship.
3. **Mutual Commitment.** How committed are the parties to overcome unexpected development obstacles? What is the track record of each party in solving problems?
4. **Responsiveness.** Do the key executives in each company have the proper authority so that a crisis can be confronted and resolved expeditiously? Is there flexibility to restructure to overcome unexpected development problems or changes in the market? Is there a personal contact with a key executive who sees the strategic logic of the relationship and is willing to risk some career capital?

5. **Longevity.** Are the parties' expectations of the duration of the relationship consistent with the potential development cycle?

III. ADVANTAGES AND DISADVANTAGES

A. Advantages to Large Established Company.

1. **Leverage Existing Resources.** Combine strong distribution, marketing and customer contacts with technological advantage.

2. **Expand or Maintain Market Presence.** Enhance existing products by filling in gaps in product lines or expanding into new products that may fit into strategic marketing plans or reduce risk of product obsolescence.

3. **Lower Cost of Development.** Lower labor costs and overhead are the hallmark of smaller companies.

4. **Access to Entrepreneurial and Technological Acumen.** In addition to the hope for cross pollination of such skills to its employees, a different perspective may be valuable because it is not constricted by the traditional methodology and view of the established company.

5. **Secure Necessary Technology or Research and Development or Keep Same from Competition.** Large companies are not always appropriate incubators for technological innovation. A strategic relationship may be necessary to preempt the technology or product from being available to a competitor.

6. **Speed of Technological Innovation.** Corporate culture of large companies may not allow it to remain current with technological innovation in emerging growth areas.

7. **Financial Upside.** Large company receives benefit of increased valuation which may be influenced by the success of the collaborative relationship.

8. **Low-Risk Acquisition Candidate.** Collaborative relationship will allow full evaluation of emerging company prior to decision of business acquisition. Initial investment at lower valuation will also reduce ultimate acquisition costs.

B. Advantages to Small Emerging Company.

1. **Validation.** Strategic relationship with established company can validate emerging company's technology or product and create tremendous credibility with customers, banks and other investors. Additional publicity and exposure may result in other strategic relationships and allow for better valuation in future financings.

2. **Ability to Focus on Core Capabilities.** Creating a fully integrated company is difficult especially in rapid growth, technologically dynamic industries. Focus and ability may be on product development without the burdens and distractions attendant to marketing, manufacturing and delivering products to market and service customers.

3. **Source of Additional Capital.** Initial cash infusion can reduce or eliminate financial strain and fund product development, marketing or creation of organizational infrastructure. Future revenue stream from royalties or manufacturing can finance future growth.

4. **Access to Experienced Managers to Fill Organizational Gaps.** An emerging company may have innovative product or intelligent marketing strategy but lack financial or human capital to conduct manufacturing, quality assurance, maintenance and field support. Regardless of whether the emerging company plans on becoming fully integrated or chooses to replicate the practices and procedures of the established company, exposure to experienced managers should speed development and accelerate learning curve.

5. **Speed to Market.** Technological and product innovations may only have a short lead time over competitors in which to bring products to marketplace.

6. **Access to Mature Distribution Channels to Broaden Market Exposure.** Some market opportunities can only be exploited by large companies with established track records and contacts.

7. **Lower Cost Financing Alternative.** Return on investment should not be the primary objective of the large company. Consequently, better valuations of equity and less dilution to owners of emerging company may be obtained in dealing with a financial investor.

C. Risk to Large Company.

1. **Market Risk.** Does the large company lose the opportunity to develop the expertise internally? If the venture is a failure, would the established company lack the expertise and technology to pursue the market opportunity independently or will it be too far behind the development curve?
2. **Financial Risk.** Unsuccessful development and worthless investment. Will ultimate investment be larger than expected because of unexpected development problems?

D. Risk To Emerging Company.

1. **Loss of Independence.** An established company may have different marketing, product development or financial agenda resulting in possible loss of business opportunity while satisfying expectations of established company. What happens if there is a change in direction, focus or executive personnel of large company?
2. **Loss of Entrepreneurial and Technology Advantage.** Conflict between entrepreneurial independence in emerging company and the organizational inertia generally found in established company is inevitable and generally leads to delay and compromise. Examine potential for loss of key employees who may have business opportunities in other development programs that are inconsistent with the objectives of the collaborative relationship.
3. **Customer Isolation.** If marketing and distribution rights are relinquished, will the emerging company lose the understanding of the customer's needs which might have been the genesis of its competitive advantage? At the end of the development program will the emerging company have the marketing expertise to compete?
4. **Risk of Piracy of Proprietary or Confidential Information or Employees.** Although contractual arrangements will prohibit this behavior, financial resources and staying power of large company can overwhelm emerging company in the event of a violation.
5. **Unfavorable Future Valuation.** An emerging company may fail to diversify and build volume in other product areas because of dependence upon large company and need to accomplish objectives of large company. Analyze possibility of a chilling effect on other sources of capital or strategic relationships.

IV. STRUCTURE

The structure of the relationship should be driven by the objectives of the parties. The variables in determining structure include

- the strength and weakness of the parties
- the desired relationship of the parties
- the type of technology or product involved and its stage of development
- the target market and method of distribution
- the ultimate situs of ownership of the technology
- the expected reward of the parties for a successful development

A. **Business Relationship.** Generally, the on-going business relationship of a strategic transaction will fall into one of the categories enumerated below. In many circumstances, transactions may be a hybrid.

1. **Joint Venture.** Generally, this is an association where the parties combine their property and expertise to carry out a business enterprise in which there is a joint property interest and control and a sharing of profit and loss. A joint venture can be conducted in a limited or general partnership, corporation or limited liability company.

2. **Product Development Agreement.** In this relationship one party funds the development of the product in exchange for ownership, licensing rights, right to purchase the product on favorable terms or right to receive royalties on sales to third parties. The developer may obtain manufacturing rights or rights to exploit the technology or products in specified market opportunities. Funding is usually based on the satisfaction of milestones.

3. **Technology Exchanges.** Exchange of complementary technologies for mutual or individual development.

4. **Licensing.** The grant of authority to use or exploit core technology or sell products. This relationship may involve co-exploitation rights of the core technology or product and/or any enhanced or improved technology and may be segmented by market opportunities.

B. **Equity Participation Structures.** If funding is necessary to allow the emerging company to accomplish the strategic goals of the transaction or if the strategic transaction is a substitute for venture capital financing, the structure may include equity participation in the emerging company or in a defined market opportunity in addition to an ongoing collaborative relationship. The type of structure, the terms and conditions and complexity will differ greatly when dealing with an equity oriented strategic partner especially in the areas of valuation, control features, liquidity requirements and ownership objectives. For example, valuation may not be aggressive because the primary focus is on achieving a return through the business relationship not a return on only a financial investment. The strategic partner may, however, request contractual covenants respecting mergers and acquisitions and other strategic relationships with its competitors

and may insist on operating restrictions or control if milestones are not met or if performance is not to the plan. The strategic partner's view toward preemptive rights, participation in future financings, registration rights and other liquidity options may be different if it has used the transaction as a preemptive to an acquisition of the entire entity and wants to control the equity destiny of the smaller partner.

Equity structures can include participation through any, or a combination of, the following securities which may be done at the emerging company level or other legal entity in which the technology product is contributed.

1. **Common Stock.** Participation in equity in which upside and downside in proportion to percentage ownership.
2. **Preferred Stock.** Preferential return of capital and payment of dividends prior to distribution to owners. Possible conversion into common stock or equivalent or participation with common in equity growth.
3. **Convertible Security.** Debt or equity instrument which is convertible into equity at option of holder or may carry required conversion or redemption upon occurrence of certain events.
4. **Warrants or Options.** Right to purchase equity at specified price for specified period may be combined with loan or as additional incentive to enter into strategic transaction.

The terms and conditions of equity structures can be implemented through contractual arrangements but often material terms are incorporated in the certificate of incorporation or other organizational documents of the entity in which the equity participation is obtained.

C. **Alternatives to Equity Participation.** Often the owners of the emerging company do not want to have their ownership diluted, but are in need of additional funding. Alternatives to equity participation may be monetary or non-monetary support such as:

- advance payment, prepaid royalties or initial license fee
- research and development funding
- loans
- guarantee of third-party financings
- leasing of equipment or facilities
- provision of personnel
- market research study
- beta site testing for new products

V. MAJOR ISSUES

The following provides a checklist of major issues and terms and conditions of strategic transactions. Although representative of major issues, it is intended to be neither exclusive nor exhaustive.

1. **Rights to Technology.** Carefully delineate ownership and licensing rights regarding both core technology as well as enhanced and improved products with an affirmation of the owner's right to use preexisting information and activities outside the venture. To what extent do enhanced technologies or practices incorporate existing technology and create issues regarding ownership? Are there any limitations on the ability to work with competitors of the parties and will there be any post development collaboration?

2. **Decision Making and Control.** Which party will be in day-to-day control? Will there be joint decision making on major business decisions such as mergers and acquisitions, deals with competitors or other equity investments? What is the nature of the operating covenants and representation on the board of directors. Classes of stock may be used to ensure level of control both at shareholder and representation on board of directors.

3. **Proprietary and Confidential Information.** Incorporate covenants not to use or disclose confidential information and consider covenants concerning restricting competition or solicitation of employees both during, and after the termination of the relationship. All officers and key personnel of the emerging company will be required to execute non-disclosure and assignment of invention agreements.

4. **Changes in Direction.** Consider mechanisms to deal with stalemates and changes in strategies or policies. Although a critical issue, it is difficult to create an

acceptable external control mechanism. If decision making is at board of director level, consider use of outside directors or having structure which does not require unanimous decision making by board of directors. Fiduciary duties are different at the board of directors and shareholder levels.

5. **Use of Development Milestones.** Focuses the parties on specific goals and tasks to be accomplished and should introduce realistic expectations regarding feasibility and timing. Milestones may serve as the benchmark for providing additional funding or a trigger for transfer of ownership, manufacturing or distribution rights. The failure to accomplish milestones may allow termination of the relationship before a complete loss.

6. **Market Exploitation.** A balance must be obtained between the large company's desire to capture the broadest possible range of marketing rights and limited competition and the smaller company's desire to carve out areas of permitted activity in order to maximize market penetration and lessen the dependence on the large company. Major issue is the exclusivity which can be defined by geographical territory, field of use, product or application linkage or restrictions and duration. Exclusivity may be terminated upon the occurrence of any of the following events: failure to achieve sales or product levels, failure to make scheduled product introductions, failure to take specified levels of marketing activities, marketing of directly or indirectly competitive products.

7. **Manufacturing Rights.** Successful relationships can be built by maintaining the right to manufacture some or all of the product or supply key components. Manufacturing is critical because it retains the ability to protect and build technology.

8. **Equity Investment.**

A. **Type of Participation.** Identify nature, rights, privileges and restrictions of equity interest whether common or preferred, convertible security, warrant or option. Equity terms may include a preference in liquidation on investment with or without cumulative dividends. What are the nature of restrictions on distributions to the owners? Does the established company have a cash-out election at sale which may have a detrimental effect on the use of a pooling transaction in a stock transaction with a third party?

B. **Liquidity.** How will the larger company recoup its investment? Will it have demand or piggy-back registration rights if the emerging company goes public? Will it have rights of first refusal to purchase shares sold by the company or its principals or will it have a right to participate in the sale of equity to another? Will these rights have a chilling effect on other potential investors?

C. **Anti-Dilution Protection, Participation and Preemptive Rights.** Participation or preemptive rights may allow large company to maintain the same percentage ownership by participating in any new financing. Does the large company have the right to participate in any future financing? At what price, for how long and what exemptions or exclusions apply? Any repricing mechanism or distribution of additional shares if future financing done at price below that paid by established company?

D. **Puts, Calls and Redemption Rights.** Under what circumstances does either party have a right to require the purchase or require the sale of the other's

shares. Consider issue not only upon successful development but also if relationship fails or key manager or technological personnel depart.

E. **Tax and Financial Reporting Issues.**

1. **Recognition of Taxable Income Upon Initiation.** If technology is to be contributed to a new entity, the contributor may desire to avoid tax on the spread between its tax basis for the technology (e.g. cost to date) and the value of the technology derived from the party's relative contributions and percentage ownership. Non-recognition devices are available such as formation of new corporation with joint capital contribution or partnership or limited liability company organization. Sufficient rights to technology must be transferred to qualify for non-recognition treatment.

2. **Choice of Entities.**

- (i) Pass Through - Partnerships including joint ventures, limited partnerships and limited liability companies taxed as partnerships. Subchapter S corporation status is not available if corporate shareholder.
 - (a) One level of tax on profits
 - (b) Loss pass through to equity owners
 - (c) Flexible structuring alternatives in sale of business
 - (d) Advantageous tax free reorganization transaction is not available on sale of entity for stock.

(ii) Separate Taxpayers - C Corporations.

- (a) Profits taxed at corporate level and dividends fully taxed unless to corporate parent.
- (b) No utilization of loss unless 80% control by corporate parent
- (c) Sale of business for stock can fit tax free reorganization models - very advantageous.
- (d) Sale of assets for cash will involve double tax unless buyer willing to acquire stock of entity from existing owners

3. **Employee Issues.**

- (a) Opportunities to acquire stock at inception complicated by Section 83 rules concerning restricted stock
- (b) Qualified incentive stock option plan providing favorable tax (capital gain) potential cannot fit partnership entity

F. **Accounting Issues.**

1. **Financial Statement Presentation.** Parties may wish to capture or avoid presentation of entity's revenue, expense or net income on its financial statements. If partnership structure, capital account fluctuations will be reflected on partner's financial statements. If corporate structure, the carryover to corporate shareholder is as follows:

ownership above 50% - - full carryover of revenue, expense, income and loss
ownership between 20% and 50% - - net profit or loss carryover only
ownership less than 20% - - no carryover of revenue, expense, profit or loss

2. **Pooling of Interest.** Reporting of acquisitions as a pooling of interest is attractive from purchaser's perspective because the spread between the fair market value and book value of the assets will not be recorded as good will and will not be a drag on future earnings. Pooling treatment is not available if the purchaser already owns 10% or more of the equity at the time of purchase of the remainder or if the consideration is not for common stock.

3. **Audited Statements.** Besides giving comfort level to purchasers and/or parties to strategic transactions, if ultimate goal is to go public or be acquired by a public company, audited statements may be a necessity. If company has no material amount of inventory, prior years financial statements may be able to be reconstructed in order to provide an audit opinion to cover those years.

End of Presentation

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On-line Services and Internet Strategic Alliances

Internet World

Peter Marx

The Marx Group

October 31, 1995

A Hypothetical Case Study

- Tennis Universe Magazine: strategy and positioning
- Potential partners
- Selected strategic alliances
- Picking partners
- Structuring relationships

Tennis Universe Magazine

- Assets to leverage
 - 2 million readers
 - Recognized name
 - Editorial and product databases
 - Search software for historical and current feeds
- Strategy
 - To become the place for tennis related information, advertising, announcements, discussions and transactions

Potential Partners

- America Online
- The Microsoft Network
- ATT Interchange
- NYNEX, or
- Own Web Site

America Online

- Internet-related acquisitions
 - Ubique Ltd. -- software for Internet chat
 - Global Network Navigator
 - Web Crawler -- search & retrieval
 - WAIS - publishing tools
 - Medior - interactive media applications
 - Booklink Technologies -- software & browser
 - Navisoft Technologies -- publishing tools
 - Advanced Network & Services -- high speed network infrastructure services
 - Redgate Communications -- multimedia & interactive marketing services

America Online (continued)

- Strategy: Online community linked to the Internet
- Online Games Partnerships
 - Yoydyne Entertainment
 - NTN Communications
 - Simutronics
 - Strategic Simulation
 - Interactive Broadcasting
 - Boxer Jam Productions

America Online (continued)

- Distribution Agreements (20 plus airplane)
 - Compaq
 - Packard Bell
 - Gateway 2000
 - DEC
- Content Alliances -- pushing for exclusives
 - Reuters
 - Time
 - Sports Channel
 - Pro Football Insider
 - ABC Sports
 - Greenhouse -- iGolf

America Online (continued)

- Revenue sharing -- varied
 - 80/20 on excess usage
 - Bounty -- \$15 per new customer
 - 85/15 on ad revenue
 - 90/10 on transactions fulfilled off-line

The Microsoft Network

- Strategy: Seamless Internet integration & vehicle for electronic commerce
- CD-ROM
- Windows 95
 - 50 million potential customers
 - anti-trust issues
- Revenue sharing
 - 70/30 on-line charges
 - 80/20 ad revenues
 - 95/5 transactions fulfilled off-line
- Web Links \$2500 - \$15,000 per month

The Microsoft Network (continued)

- Alliances

- Individual Inc. (10% equity interest)
- TCI (20% investor in MSN)
- Spyglass
- UUNET
- NBC (moved from AOL and Prodigy)
- 800 Flowers
- Reuters
- Many content partners

ATT Interchange

- ATT customer base
- Numerous other ATT efforts:
 - Business Network
 - Internet access (Netscape and BBN Planet)
 - ImagiNation Network (Sierra On-Line, NTN Communications, Dynamix)
 - ATT network
 - Local service
- Strategy: Brand publishers' platform

ATT Interchange (continued)

- Content Alliances
 - The Washington Post
 - Gartner Group
 - Ziff-Davis
 - Journal Register
 - Minneapolis Star Tribune
 - Reuters
- No plan to own content

ATT Interchange (continued)

- Revenue Split
 - Content fees: 70% publisher -- 30% ATT
 - Monthly Interchange fee: 100% ATT
 - Overtime connect charges: 5% publisher -- 95% ATT
 - Ad revenue: 85% publisher -- 15% ATT
- Publisher retains brand identity
- Internet access in Summer '96

NYNEX

- Dominant voice telephone provider within territory
- Internet access potential
- Potential of ISDN
- Strategy: unclear
- Must do acquisitions to play any meaningful role

NYNEX (continued)

- Alliances

- Infolook
- Dow Jones (wireless)
- Newsday (home shopping)
- Prodigy
- Bell Atlantic (wireless)
- Numerous divestitures of computer company acquisitions
- Viacom (\$1.2 billion)
- Bell Atlantic, PacTel and Creative Artists (\$300 million)

NYNEX (continued)

- NYNEX Information Resources Company (yellow pages)
 - Consumer information database
 - Electronic commerce
 - Complementary to Tennis Universe's database

Own Web Site Considerations

- Opportunities:

- Large and rapidly growing Internet audience
- Control versus burden to manage infrastructure
- Revenue opportunities -- subscription, advertising and transactions

- Challenges

- Security
- Development cost and risk
- Marketing
- Will Internet consumers pay?

Factors Impacting Future Marketing Positions

- Broadband networks
- Telecom deregulation
- Convergence
- Internet tools available
- Evolving Internet business model

Key Factors in Selecting Partners

- Market reach including Internet access
- Revenue split
- Time and financial investment required
- Technological strength
- Infrastructure
 - Tracking usage, ads and royalties
 - Transaction capability
 - Payments mechanisms

Structuring Relationships

- Operational
 - Cultural fit
 - Marketing
 - Development
 - Security
- Financial
 - Royalty splits -- Are we really moving from 20-80 to 70-30?
 - Expenses

Structuring Relationships (continued)

- Legal
 - Owning the customer
 - Protecting intellectual property
 - Exclusivity
 - Responsibility for liability, privacy, porn, etc..?
 - Term

Conclusions

- Set up own Web site
- Pick one partner
- Deal points
 - Non-exclusive
 - Set own prices
 - Keep a “fair” share of revenues
 - Maintain primary customer contact
 - Protect brand identity

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Designing & Maintaining Your Web Site

A Presentation for
Fall Internet World 1995
developed and presented by
Peter Morville
Argus Associates

November 2, 1995



Peter Morville

-
- Vice President, Argus Associates
 - information design consulting (Web sites)
 - Argus / UM Clearinghouse
 - Mgr of Online Services, Michigan Comnet
 - online community development
 - Background in Information and Library Studies (University of Michigan)
 - not a “techie”



Who Are You?

- Roles
 - MIS, Internet consultants, marketing, senior management?
- Experience
 - Surfing the Web?
 - Developed at least one Web site?
 - Will develop first Web site soon?



What We'll Cover

- Introduction to Web site development
- Interdisciplinary team approach
 - **architecture**, design, marketing, technical, project management
- Phases of Web site design
 - research, **conceptual design**, planning for production, production, maintenance
- Evaluation
- Keeping Current
- *Note: seeing through eyes of architecture team*



Introduction to Web Site Development

- What types of organizations develop Web sites?
 - businesses, universities, nonprofits, government agencies, publishers, etc.
 - from small to large, rich to poor
- Why?
 - marketing, sales, information dissemination, customer service, strategic positioning, return on investment



Introduction to Web Site Development (cont.)

- Under what circumstances?
 - well funded strategic project with extended timeline
 - no time, no budget
- Who develops Web sites?
 - internal staff and/or external consultants
 - ideally an interdisciplinary team approach
 - marketing, architecture, design, technical



Introduction to Web Site Development (cont.)

- Methodology for Web site development
 - interdisciplinary teams
 - phases
 - more an art than a science



The Marketing Team

- Focus on the customer / audience
 - who are they, how do we attract them to the site, how do we get them to return?
 - synthesis of conventional market research with Internet demographics
- Integration of traditional and online marketing
 - cross referencing between print and online promotions
 - exploration of online marketing and advertising channels



The Architecture Team

- Create information architecture that supports
 - ease of navigation for casual browsing and/or directed searching
 - site extensibility
- Architectural blueprint
 - organization of information, labeling conventions, application of search capabilities, use of navigational aids
 - varying levels of detail (site level, page level)



The Design Team

- Develop design philosophy
 - balancing form and function (graphics)
 - design for multiple platforms and browsers
- Design graphic and textual elements
 - graphic design
 - page layout
 - copy editing
 - HTML page production



The Technical Team

- Consultant to other teams
 - what's possible, application implications
- Production / maintenance
 - tools, processes, procedures for initial development and ongoing operation of site
- Develop / integrate advanced software tools
 - searching, online databases, registration / authentication, conferencing



The Project Management Team

- Team coordination and communication
- Keep project within budget and on time
- Manage financial and legal issues
- Report to senior management
- Communicate team needs to senior management



Working Together

- Project manager coordinates
 - identify areas of overlap
 - more importantly, fill gaps
- Considerable collaboration
 - particularly in research and conceptual design phases



Phase I: Research

- An information gathering phase to identify:
 - vision
 - mission and goals
 - audience (s)
 - content definition and collection
 - contacts and communications



Why Vision is Important

- Paradigm shift in communication and information sharing
 - Long term implications on par with printing press, telephone
 - Internet is new and dynamic environment
 - processing speed and bandwidth increasing
 - interface improving
 - people and businesses learning to use the technology



Why Vision is Important (cont.)

- What will this mean to your business? Your industry?
 - do you need to change to survive?
- Leveraging the medium (3 levels)
 - 1. marketing
 - 2. sales / online transactions
 - competes with existing sales programs
 - 3. innovation
 - new products and services
 - new markets



Mission and Goals

- Matching missions
 - rethinking your mission statement
 - your organization and your Web site
- Identifying and examining goals
 - long term strategy vs. short term return on investment
 - experimentation vs. mission critical
 - sales, marketing, information dissemination, customer service



Audience(s) Definition

- Identify your target audience(s)
 - consumers, businesses, business partners, investors, internal staff, journalists
- Audience analysis
 - does / will your audience use the Web?
 - what information is most important to them?
 - how do they currently seek / find information



Content Definition and Collection

- Content brainstorming
 - facilitated sessions with individual divisions / departments
- Content analysis
 - towards a collection development policy
 - what's in / what's out
 - setting priorities: from dreams to reality
 - costs (production, maintenance), copyright issues
 - present vs. future



Contacts and Communications

- Who are the experts within the organization with respect to:
 - various areas of content
 - audience
 - marketing
 - graphic design
 - technical infrastructure
- How will teams communicate with:
 - each other, senior management, staff, customers



Phase II: Conceptual Design

- Defining **what** the Web site will be
 - form and function
- Architectural blueprint
- Design philosophy
- Templates for main and subsidiary pages
 - integrating text and graphics
- Design of advanced tools / features
- Inclusionary approach (“buy-in”)



What is Web Site Architecture?

- Organization of information
- Labeling of information
- Cross-referencing
- Application of search capabilities
- Elements of navigation



Why is Web Site Architecture Important?

- User's perspective
 - navigation and usability
 - support casual browsing and directed searching
 - avoid confusion and frustration
- Organization's perspective
 - support goals of marketing team
 - allow for smooth growth of Web site without costly reengineering



Top Level Pages

- Gateway pages
 - initial point of entry to Web site
 - serve marketing goals (billboards for “splash”)
 - serve a shepharding role (e.g. redirection to audience specific pages)
- Main menu pages
 - the “home page” as an information system interface
 - focus on navigation and ease of use
- Separation vs. integration



Organization of Information

- Organization schemes:
 - subject or topic, audience, department, chronology, geography, product or service, format, static vs. dynamic
- Metaphor exploration
 - an online store, library, magazine, etc.
- Consider multiple schemes



Labeling

- Use the language of your audience
- Practice consistent usage and syntax
- Investigate use of controlled vocabularies or thesauri, but realize don't always scale well

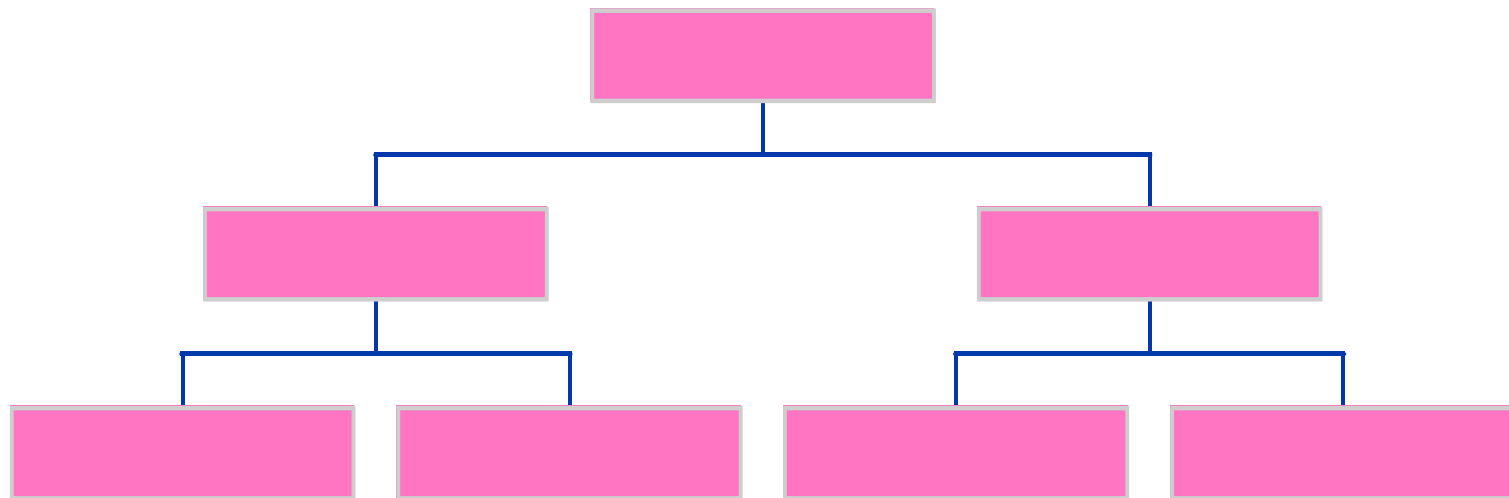


Ideas for Organizing and Labeling

- Card sorting
 - index card for each content item
 - organize cards into groups and label those groups
 - try with staff, senior management, intended audience(s)
- Review organization schemes of other Web sites
- White board brainstorming



Hierarchical Organization



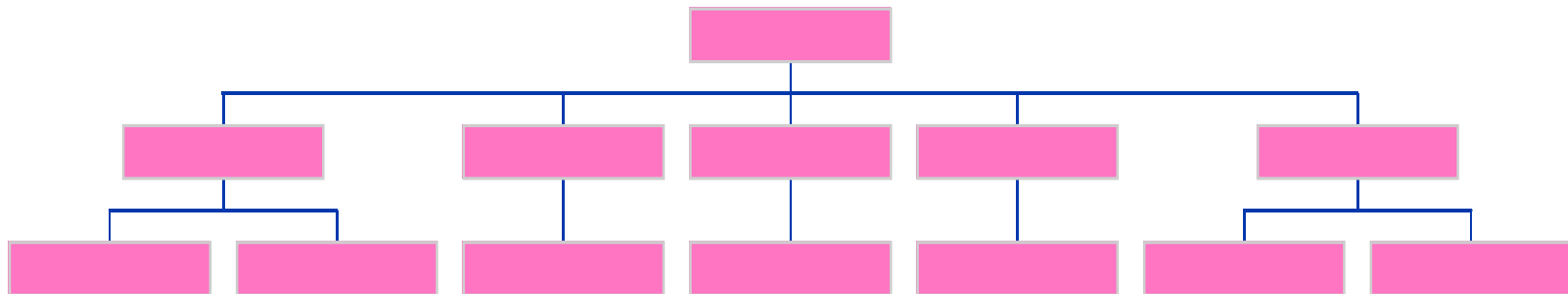


Hierarchical Organization Schemes

- Information divided into mutually exclusive subdivisions
- Classes and subclasses (parent / child)
- Very common and familiar way of organizing information
 - org. charts, animal kingdom, library catalogs
- Important to balance breadth and depth
 - broad vs. narrow
 - deep vs. shallow

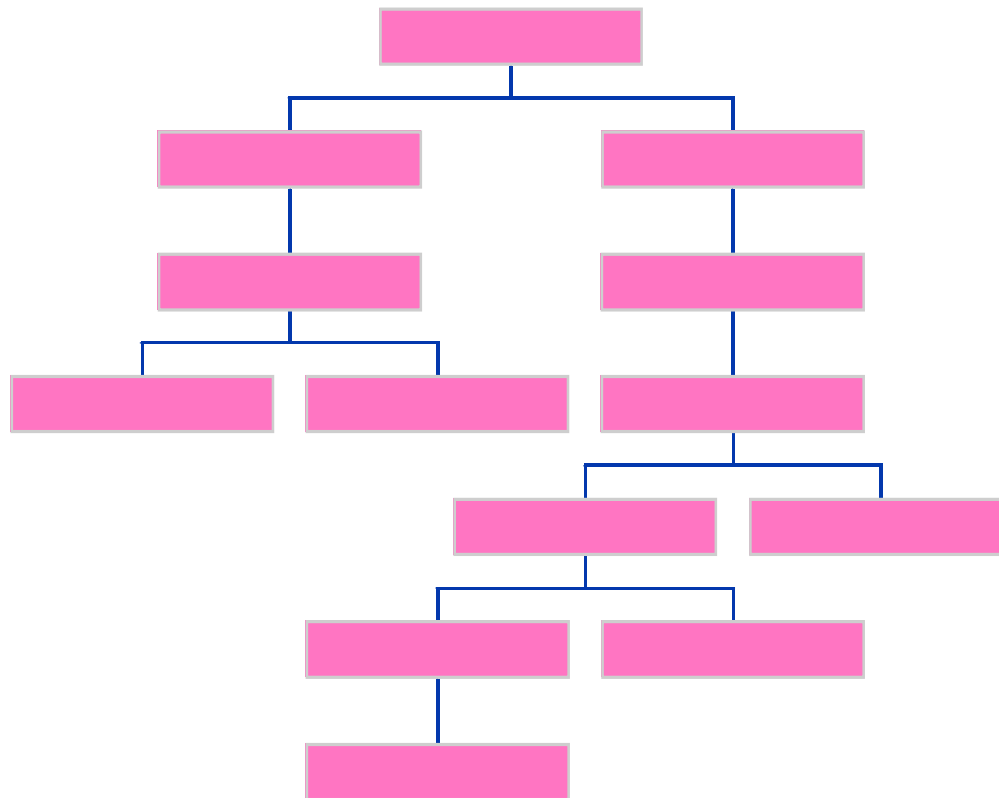


Broad and Shallow





Narrow and Deep



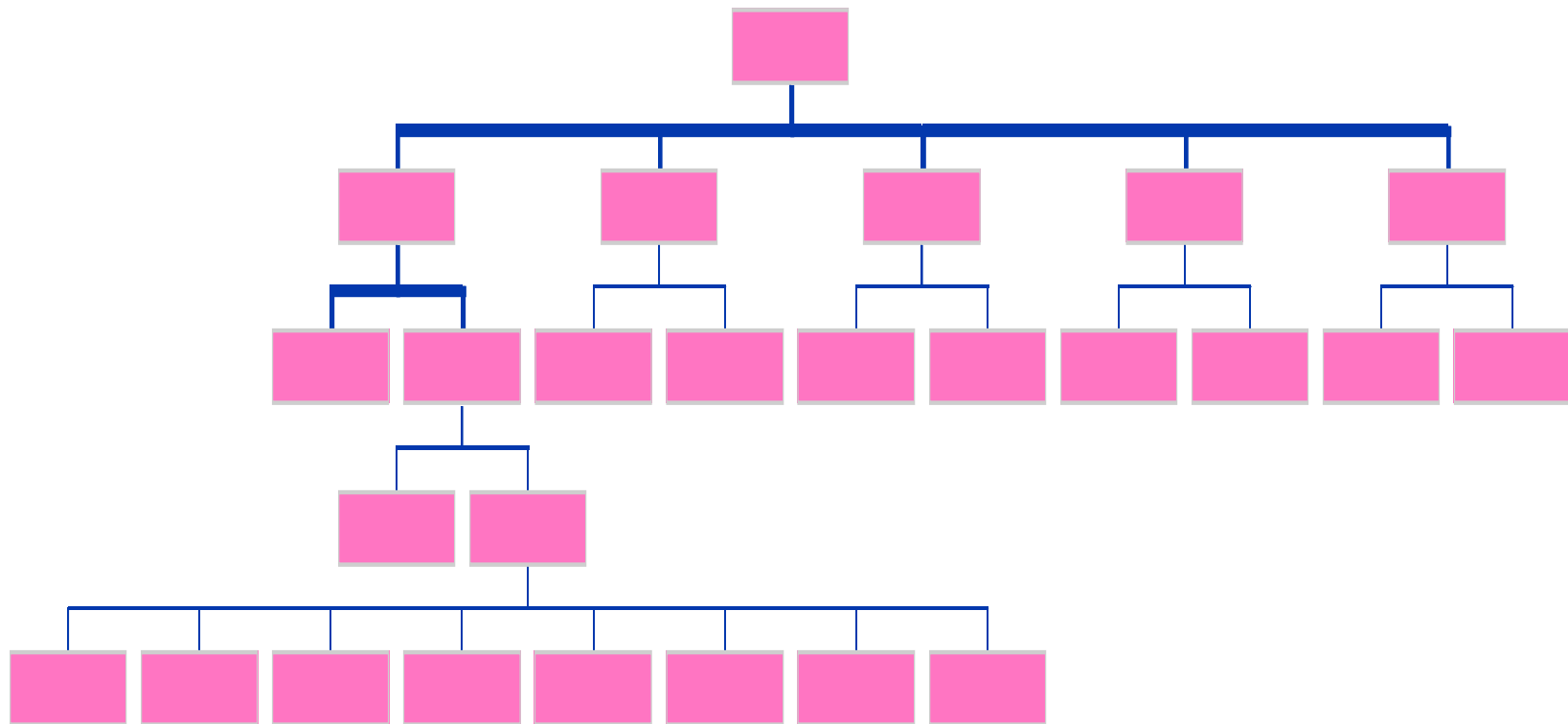


Heuristics for Hierarchies

- Limit number of choices per menu to 8-12
- Limit number of hierarchical levels to 3 or 4
- Studies in human-computer interaction indicate hourglass structure works best (8-3-3-8)



Hourglass Structure

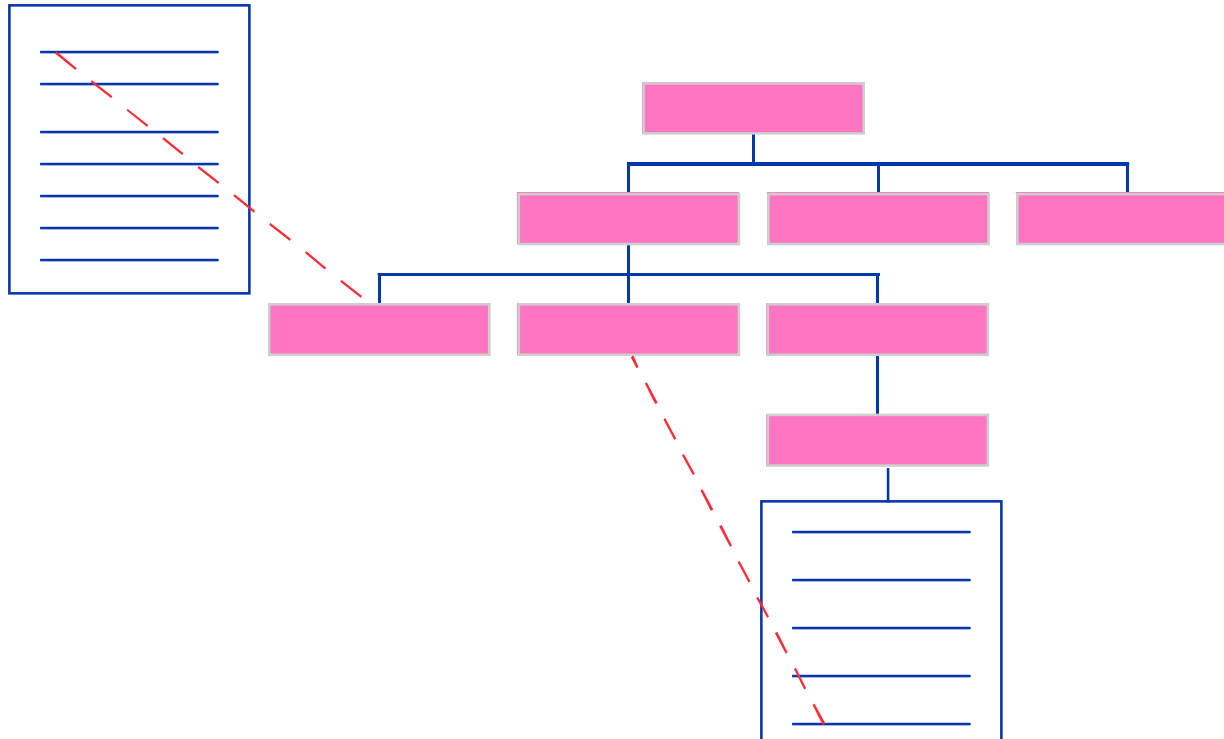




- Highly flexible system of organization
- Links can connect
 - words, phrases, documents, images, video and audio clips
- Supports multiple pathways to the same information
- Can be very disorienting to user
- Added demand on navigational elements
- Can be used to compliment hierarchy



Hierarchy and Hypertext





Navigation

- Navigational elements implemented at page level but site-wide implications
- Goals
 - provide sense of context and consistency
 - facilitate browsing and searching
 - balance ability to get anywhere from anywhere with desire to avoid clutter

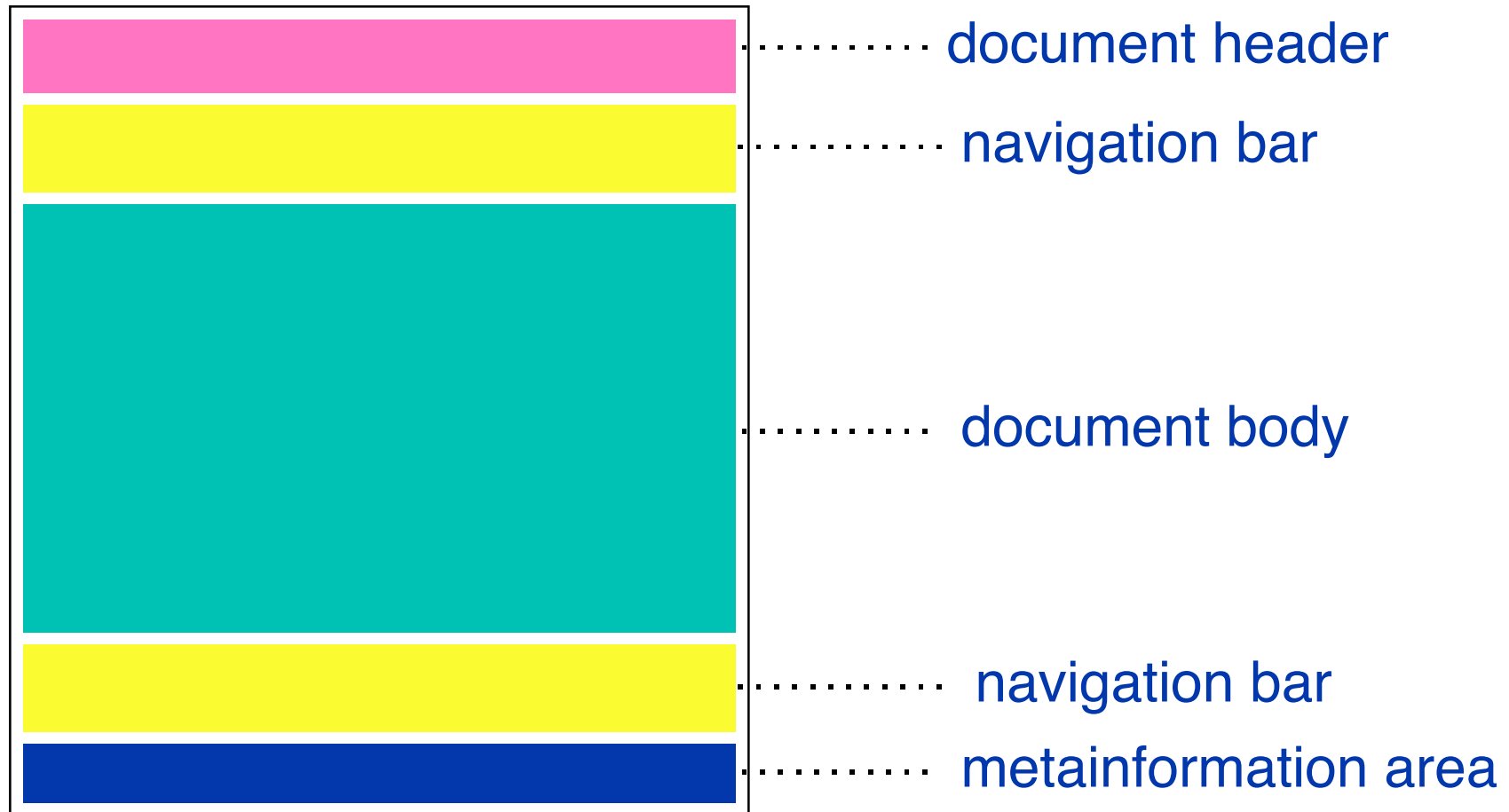


Navigation (cont.)

- Consistent use of landmarks
 - organization of elements on a page
 - links to gateway, index, and/or section pages
 - links to searching interface
 - other popular sections?
- Textual and/or graphical aids
 - hypertext links, arrows, maps, icons



Elements on a Page





Document Header

- Provide contextual clues through use of text and/or graphics
- Textual Clues
 - inclusion of Web site title
 - textual links showing position in hierarchy
- Graphical Clues
 - common elements from Gateway page
 - use of size
 - use of color schemes

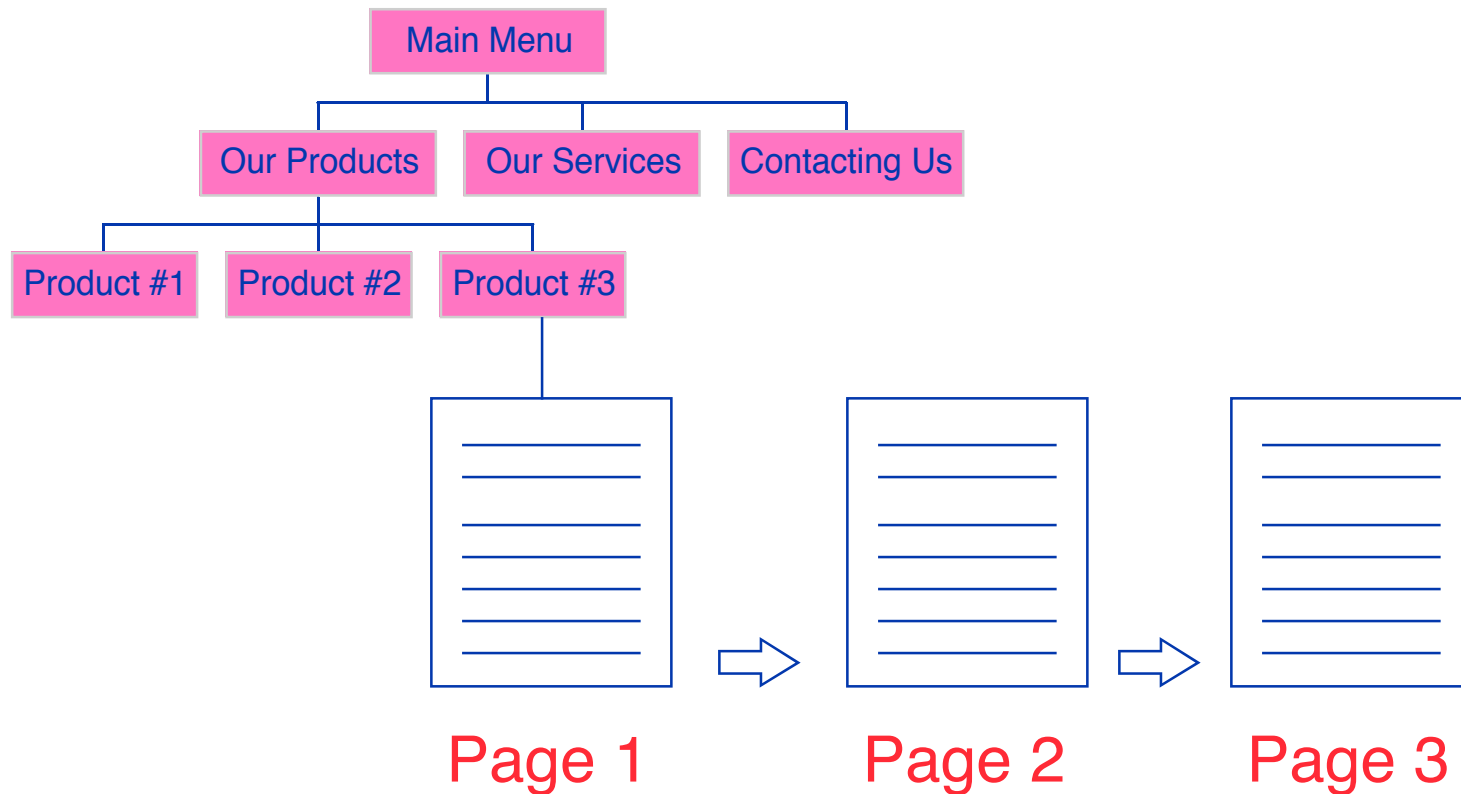
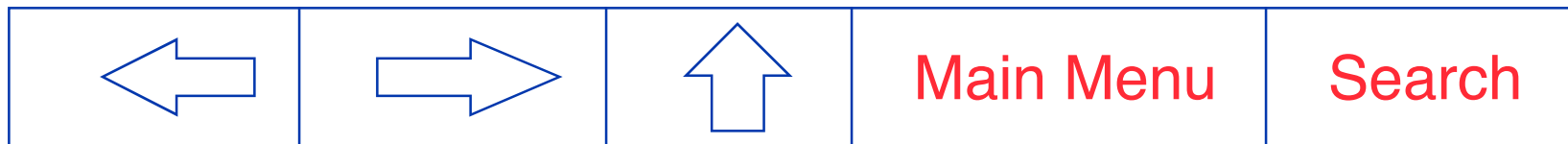


Navigation Bar

- Integration into header
- Include at top and bottom
- Specific links
 - main menu, our products, our services, contacting us
- General navigation bar
 - next page, previous page, move up a level

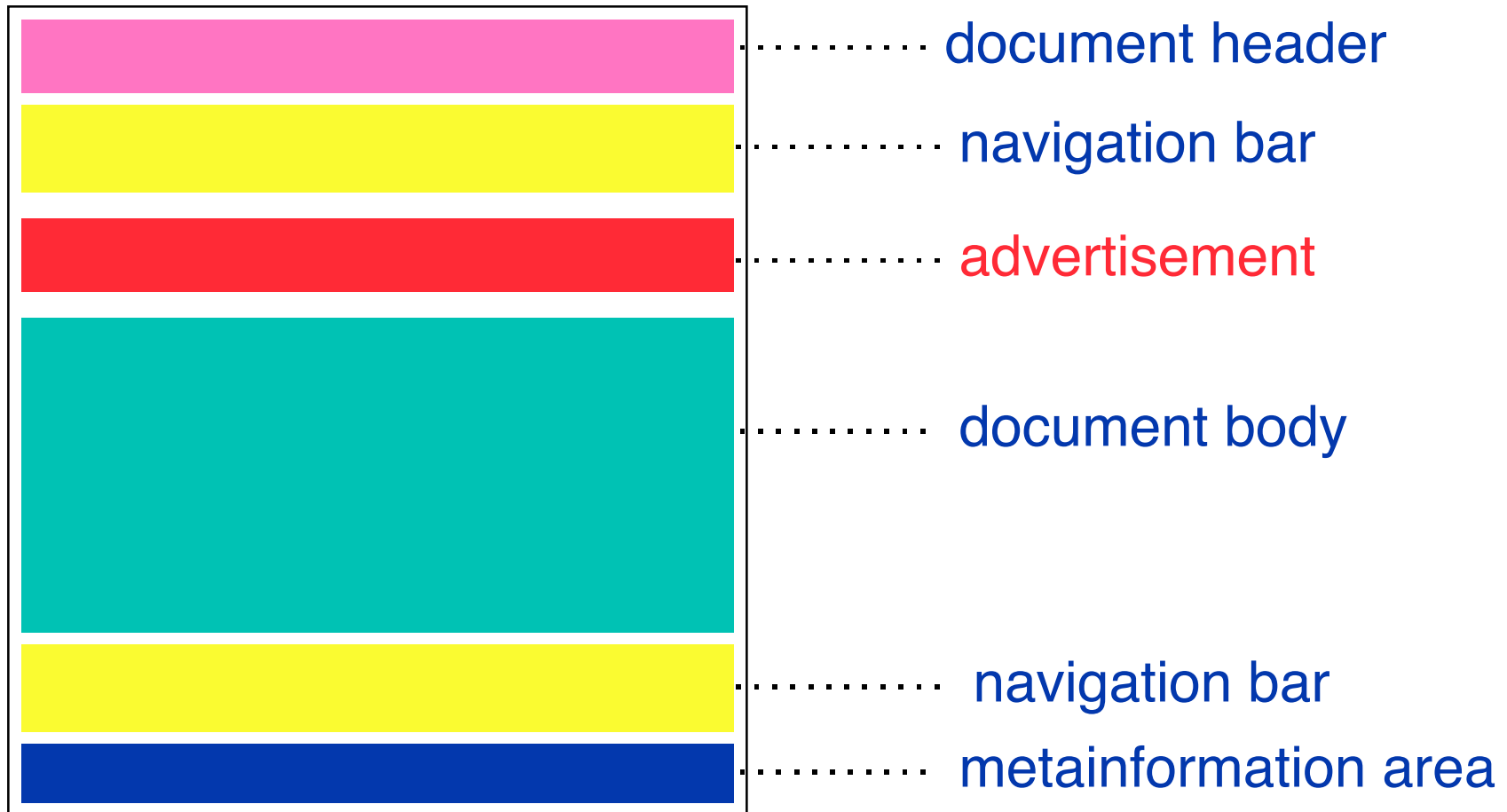


Navigation Bar (cont.)





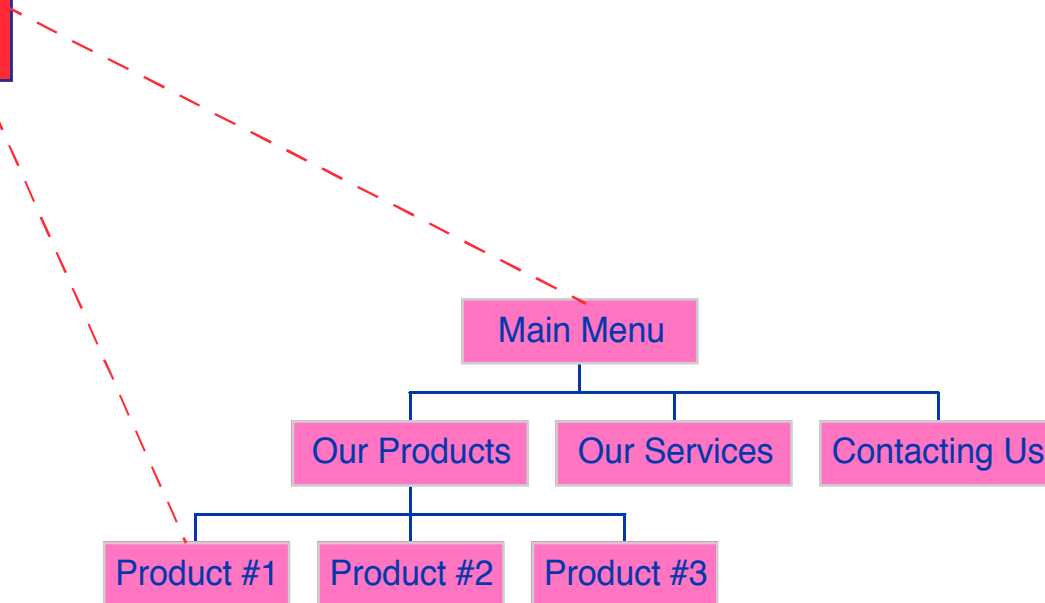
Architecture and Marketing





Architecture and Marketing (cont.)

Billboard





Architecture and Marketing (cont.)

- *Case study: Netscape Communications*
 - <http://home.mcom.com/>



Searching Your Web Site

- What will be searched?
 - menu and document titles
 - index with fields (keyword, author, etc.)
 - full text of all documents



Searching Your Web Site (cont.)

- Query interface design
 - clear explanation of what is being searched
 - clear explanation of how that body of information can be searched (Boolean, proximity, adjacency, string, case sensitive, nesting, relevance ranking)
 - explicit relationship between browsing and searching interfaces
 - novice and expert interfaces



Advanced Tool Design

- Registration and authentication
- Interactive online databases
- Conferencing software for group discussions
- Online forms for questions and/or feedback



Usability Testing

- Prototype
- Test on intended audience(s)
 - talk out loud
 - casual browsing
 - directed searching (example searches)
- Redesign
- *Case study: Sun Microsystems*
 - <http://www.sun.com:80/sun-on-net/uideesign/sunweb/>



Phase III: Planning for Production

- **How** the Web site will be implemented
- Needs analysis and resource identification
 - people and technology
- Technical and architecture teams
 - information ownership blueprint
 - who creates, manages, owns the information
 - process ownership blueprint
 - how does it get from the information owner onto the Web site (centralized vs. decentralized)



Phase III: Planning for Production (cont.)

- Data processing procedures
 - how much information already in digital formats
 - explore cost of conversion vs. data entry
 - in-house vs. outsourcing
- Project Management
 - planning of parallel processes
 - identification of dependencies
 - keep to budget and timeline



Phase IV: Production

- Ideal
 - filling in blanks or painting by number
- Reality
 - demand on project manager to keep on time and within budget (crisis management)
- Parallel Processes
 - staff training, creation of documentation
- Beta testing
 - by teams and intended audience(s)



Web Site Launch

- Avoid launching too early
 - one chance to make first impression
 - construction signs and shallow sites do not leave good impressions
- Integrated marketing effort
 - traditional marketing channels
 - press release, advertising, print literature, business cards, etc.
 - Web based marketing
 - directories
 - discussion groups
 - online advertising



Phase V: Maintenance

- Keeping content fresh / up to date
- Responding to user feedback
- Managing growth
- Evaluation of success



Web Site Evaluation

- Standard usage logs
- Registration and authentication
- User surveys
- Lead tracking



Presentation Review

- Interdisciplinary team approach
 - **architecture**, design, marketing, technical, project management
- Phases of Web site design
 - research, **conceptual design**, planning for production, production, maintenance
- Evaluation



Keeping Current

- Technology changes but design philosophy remains stable
- Keep up with evolving capabilities
 - HTML, Java, VRML
- Review resources for Web design
- Hire a consultant

End of Presentation

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Web Learning ...from commerce ...to communication ...to collaboration

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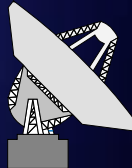
Presentation Roadmap



Introduction



Commerce



Communication



Collaboration



Wrap-Up



The Starting Point: Commerce on the Web

- What does it mean?
 - *Selling goods and services...*
 - *or is it much more?*
- Sales support, marketing, business development
- Background Info
 - *reputation and history*
 - *market position*
 - *people*



Commerce Is

- The exchange of money for goods and services
- The flow of Information
 - *To key audiences*
 - *Already a mainstay on the Internet*



Does it make sense to start with commerce?

- Point-of-Sale is intriguing
 - *in a nickel and dime sort of way*
- Its simplicity makes it an ideal lens



Key Words for the Day

- **Commerce**
- **Information**
- **Infrastructure**
- **Knowledge**
- **Collaboration**
 - ***Teamwork***
 - ***Common Cause***



Internet Teamwork???

- **With others in your organization**
- **With external partners and allies**

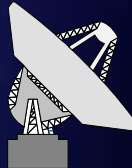
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- Billing
- Inventory
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- Customers

**Real-World
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- Accounting
- Payroll

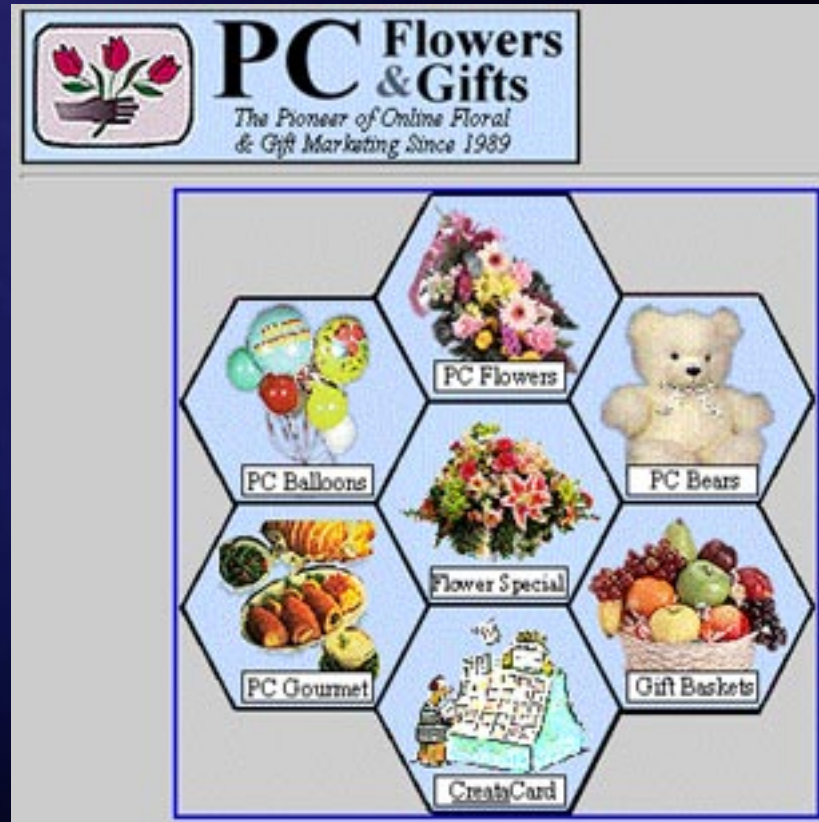
**Traditional
Channels**

**The
Marketplace**

Commerce Model I



So Who's Buying and Selling on the Net Today?





So what's the hold-up?

- Ubiquitous Access?
- Secure Transactions?
- How about customer behavior?

**The
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**Real-World
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**Real-World
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Pre-Sale Support

- Catalogs
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- Inquiry Response

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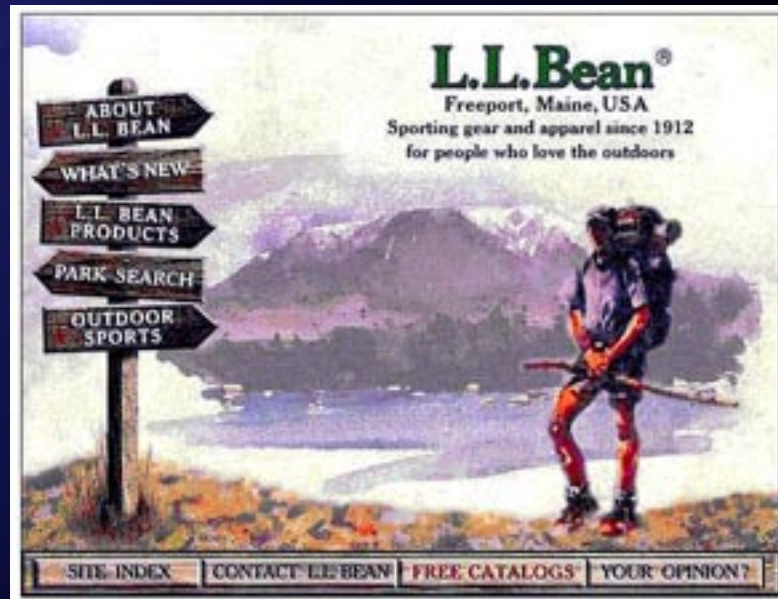
Commerce Model II



You Need Information to Clinch the Sale...

- like product and service descriptions
- product descriptions + pictures + ordering information = **CATALOGS**

Visiting LL Bean





Identity Counts, Because

- **Prospects Want Context**
 - ***Who we are***
 - ***What we do***
 - ***Our markets and spheres of operation***
 - ***Our specialties***
 - ***Our mission and values***
 - ***Our history***
 - ***Our view of the future...***

These all play a part in disposing a prospect to buy



Web Commerce is more about Web Communication

...than point-of-sale
transactions...

and success in
communication is as much
about *how* you
communicate as *what* you
communicate.

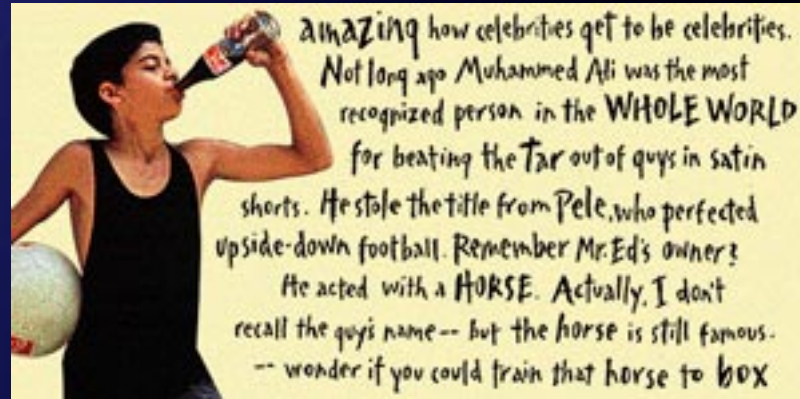


Building prospect confidence is key

- You can answer his or her unique needs
- You understand those needs perfectly
- He or she *belongs* in the community of interest you anchor.



Visiting Coca-Cola



**Sometimes Web Commerce
isn't about point-of-sale at all.**

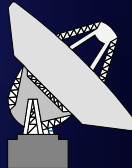
Presentation Roadmap



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Coke's Audiences

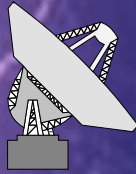
- young and hip to the Net
- looking for diversion, not hard-sell
- not wowed by the trappings of authority.
- other segments:
 - ***sports fans***
 - ***memorabilia collectors***
 - ***investors (lip-service, just in case)***



Coke's Web Messages...

- are life-style oriented. They say “Life is way-cool.”
- they don't say “buy some Coke right now.”

This is **MARCOM.**



It's an easy transition

- **from giving life-style *warm fuzzies* to ...**
- **providing useful information geared to life-style ...*or***
- **more serious areas of interest.**



Other Segments Join the Web's Global Audience

- **media**
- **securities analysts**
- **other professionals**
- **institutional investors**
- **researchers**
- **the intellectually curious**

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- Industry Allies
- Opinion Leaders
- General Audiences

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Communication Model



The Trend...

- **Commercial content is becoming more serious**
- **This is especially evident in the services sector.**



Visiting IBM





Big Blue's Web Content

- **Identity elements**
- **“Image” elements**
- **Information elements**
- **Service elements**
- **“Fun” elements**



Big Blue's Web Intent

- **Communicate the full scope of its operations**
- **Sell you on its value.**



IBM's Stylistic Hallmarks

- use of mixed-media modes
- solid intellectual content
- no hesitation to use heavily *textual* elements

RESULT: a pretty comprehensive overview of the company.



Beyond Pure MARCOM

**a new wrinkle: presenting
corporate know-how, AKA...**

INTELLECTUAL CAPITAL



Intellectual Capital = Corporate Knowledge and Experience

**Organizational knowledge and
experience, as embodied in..**

- **market offerings**
- **systems**
- **research activities**
- **human resources**
- **business processes**
- **history and values**

AND...



Relationships

- with markets and customers
- with capital markets and investors
- with governments and regulators
- with industry allies
- with social entities
- within the enterprise
(at *all levels*)



Institutional Knowledge and Experience

**...becomes valuable only when it's
captured and shared.**



**The Internet offers the best means
for bringing this material to the
attention of stakeholders.**



Intellectual Capital in a Mixed-Media Key

As bandwidth expands and compression technologies improve, watch for an explosion of new approaches.

WEB PUBLISHING MODES

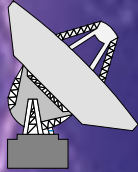
	Words	Images	Audio	Video	Page Layout
CERN	HTML				
Early Mosaic		-inline -"paged"	file-based .au <i>et al</i>	file-based .mpeg/.mov	"raw" (+ EPS Downloads)
					
2nd Gen. Browsers	forms	image maps			tabular
	DB searches	pull-push			"paged" (.pdf)
Helper Apps			streamed (RealAudio)	streamed (Xing)	

NEXT ... HOT JAVA ... VRML



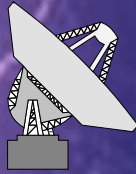
But Don't Diss Text Yet

**It's poised for a
resurgence on the Web.**



Visiting a Text Site or Two





Media Architecture

- Strategic vision of media re-use
 - ***Multi-modal***
 - ***Multi-channel***
- Tactical repository of intellectual capital
 - ***Data base***
 - ***Text***
 - ***Print***
 - ***Video***
 - ***Audio***
 - ***Composite products***



The Dual Challenge in Managing Media Architectures

- Managing these resources as reusable objects
- Managing the enterprise-wide processes of transposing *intellectual capital* into media objects.

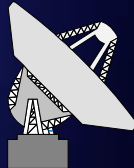
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**Traditional
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- **Customers**
- **Potential Customers**
- **Opinion Leaders**
- **General Audiences**

Virtual Collaborative Net

- **Industry Allies**
- **Partners**
- **Suppliers**
- **Market Outlets**

**The
Marketplace**

Collaboration Model



Internal Networks

Intranets allow broad based participation in the life of the enterprise

- **Discussion Groups**
- **Organic Databases**
- **Departmental Web Spaces**
- **Collation/Rapid Prototyping of Intellectual Capital**



Internal Networks

Intranets become the lifeblood of the enterprise

- **Human Resources**
- **Project/Initiative Management**
- **Resource Allocation**
- **Virtual Workforce Platform**



External Networks

- **Embody Relationships**
- **Enable Intranet style processes on a global stage**
- **Keiretsu²**

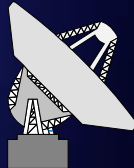
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Leaders of the Internet

The Internet in the Year 2010



John R. Patrick

Vice President, Internet Applications

IBM

The Internet in 2010: The Road to the Future

- ◆ Where We've Been
- ◆ Where We Are Today
- ◆ Where We're Headed.....
 - in Business
 - as a Society

Where We've Been

- ◆ From curiosity to media darling
- ◆ From grassroots to corporate boardrooms
- ◆ “Get connected”

“Get connected”

- ◆ Email@GetCo.com
- ◆ Directory_assistance@GetCo.com
- ◆ Experts_and_executives @GetCo.com
- ◆ Info @GetCo.com
- ◆ WWW @GetCo.com
- ◆ Sales_and_services @GetCo.com

<http://www.ibm.com/patrick>

Where We Are Today

- ◆ Education Continues
 - The Net as mainstream I/T
 - TCP/IP as extension
 - Massive disintermediation
 - Bandwidth
- ◆ Issues not yet framed for resolution
 - Security, Encryption and Privacy
 - Content rating

Where Business is Headed

- ◆ One global Internet integrated with legacy
- ◆ Global security well understood & managed
- ◆ Open standards predominant-IP everywhere
- ◆ E-commerce a very large market segment
- ◆ Software reuse enabling market driven I/T
- ◆ “Get connected” enabling complete access
- ◆ Responsive, agile companies prospering

Where Society is Headed

- ◆ Encryption and authentication taken for granted and trusted
- ◆ Public Access to the Web
- ◆ Bandwidth not a limitation - agents to help
- ◆ Physical communities based on lifestyle
- ◆ Geoindependent work and collaboration
- ◆ Internet as cultural, economic equalizer

The Future is Now!

- ◆ Unlimited reach for businesses and organizations
- ◆ Unlimited choice for individuals
- ◆ It is up to you and I
- ◆ Let's go for it and “Get connected”!

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COMPUTER CRIME

**Kenneth Rosenthal, Esq.
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New Haven, Connecticut**

I. Federal Criminal Provision Governing Unauthorized Computer Access

A. 18 U.S.C. §1030 (Computer Fraud and Abuse Act) -- Prohibits unauthorized access to computer system, through means of a computer used in interstate commerce, with intent to damage or withhold use of computer, program or data, provided there is loss or damage in the aggregate amount of \$1,000 or more during any one year period; unauthorized access to federal government, financial institution or credit reporting agency computer data; or trafficking in passwords or similar computer access information. Penalties include fines or jail terms of up to twenty years.

B. 18 U.S.C. §2701 (a part of E.C.P.A., which primarily deals with wiretapping and prohibitions against interception and disclosure of electronic communications, as described in Part IV, below) -- also provides criminal penalties for obtaining, altering or preventing access to electronic communications while in electronic storage through unauthorized access to an electronic communication service. Unlike CFAA, there is no minimum damage requirement, but the penalties are far less severe than under CFAA, with jail terms of six months to two years.

II. State Computer Crime Statutes

Varying statutory provisions establishing criminal liability for, inter alia, unauthorized access to use of a computer system, intentionally altering or destroying computer data or program, theft of computer services, unlawful possession of computer-related materials, destruction of computer equipment and fraudulently obtaining commercial computer services. Some statutes also provide civil causes of action for damages, injunctive relief and attorneys' fees. The **attached chart** provides citations to the 50 state laws with an analysis of the types of offenses covered in each state.

III. Other Criminal Statutes Used in Recent Prosecutions of Internet Activity

1. 18 U.S.C. §1343 (Wire Fraud) -- An extremely broad statute penalizing the transmission of a wire communications in interstate commerce in furtherance of any scheme to defraud or to obtain money or property by means of false or fraudulent pretenses.

2. 18 U.S.C. §875(c) (Interstate Communication of a Threat) -- Penalizing the communication of any threat to injure the person of another. Unlike most state harassment statutes, this federal statute does not require that the threat have been communicated to the victim. A federal district judge in Michigan recently dismissed the highly-publicized prosecution of an University of Michigan undergraduate for the transmission of E-mail messages under this statute. See United States v. Baker, 890 F. Supp. 1379 (E.D. Mich. 1995).

3. State Harassment Statutes -- These laws typically include mischievous use of wire communications to harass another person, whether or not a "conversation" takes place -- e.g. prank calls including, but not limited to, abusive language. There are also some statutes specifically directed at E-mail harassment. One recently publicized example is contained in

Section 53a-182b of the Connecticut General Statutes, as amended in June 1995, to include intentionally harassing threats communicated by computer network, and the transmission of intentionally harassing indecent or obscene language by computer network. For an analysis of the need for such statutes to supplement existing harassment statutes, see Note, *Taking a Byte Out of Crime: E-Mail Harassment and the Inefficacy of Existing Law*, 70 Washington Law Review, 465 (1995).

IV. Electronic Communications Privacy Act, 18 U.S.C. §2510 et. seq.

E.C.P.A. amended the federal wiretap statute to encompass electronic communications. It governs the interception and disclosure of in-transit electronic communications (Title I), and access and disclosure of electronic communications while in electronic storage (Title II). The proscription against interception of live communications are far more stringent than those with respect to accessing communications in “electronic storage”. Stored communications may regularly be accessed by the operator of an electronic communications service. In-transit communications, on the other hand, may only be intercepted under limited circumstances. In the case of the systems operator, such circumstances include interception by the operator’s

officer, employee, or agent . . . in the normal course of his employment while engaged in any activity which is a necessary incident to the rendition of his service or to the protection of the rights or property of the provider of that service, except that a provider of wire communication service to the public shall not utilize service observing or random monitoring except for mechanical or service quality control checks.

18 U.S.C. §2511(2)(a)(i)

There is a further exception permitting interception by any person of “an electronic communication made through an electronic communication system that is configured so that such electronic communication is readily accessible to the general public.” *Id.* §2511(2)(g)(1). In other words, the prohibition against interception does not apply at all to such publicly accessible communication as those involved in public Usenet groups.

The distinction between in-transit communications and communications in electronic storage is somewhat slippery, but seems to err on the side of defining virtually all electronic communications as “stored communications” except at the moment when actually in transmission. The statute defines electronic storage as (A) any temporary, intermediate storage of an electronic communication incidental to electronic transmission, and (B) storage of such communication by an electronic communication service for purposes of backup protection. 18 U.S.C. §2510(17). Commentators have noted that the legislative history of the statute suggests that the term electronic storage even encompasses storage in RAM. Similarly, the Court in Stephen Jackson Games, Inc. v. U.S. Secret Service, 36 F. 3d 457 (5th Cir. 1994), while awarding the system’s operator damages against the Government for seizure of his computer system under the applicable provisions of Title II, held that Title I (providing more substantial damages) was not violated despite the fact that a large number of undelivered E-mail messages were included in the seized materials. The Court based its conclusion on the statute’s broad interpretation of electronic storage and correspondingly narrow interpretation of electronic communications in-transit.

E.C.P.A. prohibits unauthorized disclosure of the contents of electronic communications, whether stored or in transit, unless certain exceptions are satisfied. In other words, the privacy of E-mail communications, even while in temporary “storage”, is protected from disclosure

regardless of whether it is protected from access by systems operators. Among the exceptions to the bar on disclosure, there are exceptions in the case of a systems operator making disclosure to intended recipients of the communication, disclosure to persons to whom disclosure is necessary as an incident to the rendition of the services being performed, disclosure necessary to the protection of the rights or property of the provider of the service, and disclosure to a law enforcement agency of the contents of an electronic communication which appears to pertain to the commission of a crime, provided in the latter instance that the service provider had inadvertently come upon the contents of such communication in the first place. A service provider is also expressly protected from liability for disclosure pursuant to a court issued wiretap order or subpoena.

Interception and disclosure prohibitions do not apply where one party to the communication consents. Thus, if the service provider is itself a party to the communication, or if some other party to the communication discloses it or authorizes interception, the prohibitions of E.C.P.A. would not apply.

IV. Responding to Search Warrants and Subpoenas.

As the Stephen Jackson Games (SJG) case graphically illustrates, the execution of a search warrant on an innocent business enterprise which may happen to be in unknowing possession of evidence of a crime (or of what law enforcement suspects may be a crime) can be disruptive in the extreme. In the SJG case, federal agents pursuing the prosecution in Chicago of individuals involved in the copying of a telephone company document relating to the E 911 system, obtained a search warrant for the Austin, Texas premises of Stephen Jackson Games, the publisher of various books, magazines and games, and the operator of a BBS used in conjunction with its business. The warrant authorized the federal agents to seize:

[c]omputer hardware . . . and computer software . . .
and . . . documents relating to the use of the computer
system . . ., and financial documents and licensing
documents relative to the computer programs and
equipment at . . . [SJG] . . . which constitute evidence
. . . of federal crimes . . . This warrant is for the
seizure of the above described computer and
computer data and for the authorization to read
information stored and contained on the above
described computer and computer data.

In executing the warrant, the federal agents seized the entire computer system used to operate the BBS, containing more than 100 items of undelivered private E-mail, various work in progress essential to SJG's publishing business and other unrelated hardware and software, including laser printers which could not conceivably have contained anything of relevance to the investigation. Despite the entreaties of legal counsel and contacts with political representatives, it was not until four months later that SJG was able to obtain return of the equipment, and substantial damages were incurred as a result of the disruption of its business.

The Fourth Amendment to the United States Constitution protects one's person, houses, papers and effects from unreasonable search and seizure, and provides that a warrant can only issue upon a finding of probable cause by a neutral magistrate based upon a factual submission under oath, stating with particularity the place to be searched and the items to be seized. The reality is that hundreds of thousands of search warrants are issued in the course of each year and the scrutiny with which they are addressed in the initial instance is often minimal. As the SJG case illustrates, it is only after the fact -- after the damage has been done -- that a person subject to search can have any input whatsoever as to the scope or reasonableness of the search and seizure in question. After a particularly egregious instance of third party search of the Stamford University Daily had been upheld by the United States Supreme Court some decades ago, Congress enacted legislation to provide special additional protection in the case of publishers, and the Justice Department now has guidelines limiting the instances and manner in which search warrants will be sought in such cases. Many states have similar statutes. However, as the Stephen Jackson Games case once again illustrates, these protections are not necessarily effective. It should be noted that unlike most bulletin board operators, Stephen Jackson Games enjoyed the protected status of a traditional publisher, but nevertheless suffered the consequences of an overbroad unannounced search.

What can one do in the face of a search warrant? First of all, the search warrant may very often be executed with no advance notice. Second, no matter what one may think of the search warrant at the time of its execution, it is a crime to interfere with the execution of a search warrant. At the same time, reasonable efforts can be made to persuade the executing officers that one will fully cooperate in the search and, in return, hopefully acquire some opportunity to inject informed reason into the search process based on knowledge of the computer system that the executing officers are not likely to have. At the same time, if at all possible, one should get legal counsel involved and on the scene.

If, instead of a search warrant, the government chooses to proceed by subpoena, there is automatically an opportunity to have legal counsel involved, to contact the federal agents and the United States Attorney identified on the subpoena and, if negotiations concerning the scope of the subpoena do not produce satisfactory results in advance of the deadline for responding, to get into court to move to limit or quash the subpoena. Moreover, along with advance notice and an opportunity to be heard, the subpoena carries the additional advantage that the system's operator himself, rather than some law enforcement official will be the one to gather and turn over the

requested evidence -- a distinction of special importance in the case of evidentiary seizures directed at computer systems by law enforcement officials unschooled in the subtleties of computer hardware and software, to say nothing of the networks that tie them together. Further, there may be an opportunity to negotiate the use of duplicate copies of requested materials without disruption or loss of use of the items in question for operating purposes. Indeed, E.C.P.A. makes express provisions for such backup copying in the case of subpoenas for evidence issued pursuant to its provisions, complete with provisions for reimbursement of the owner of the searched facilities for the costs of searching, assembling, reproducing or otherwise providing information to the government in connection with duly issued court orders and subpoenas. See 18 U.S.C. §2706.

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Editor's Note: While many Internet access providers use operating systems other than UNIX, it is the most widely used system on the Internet. Even non-UNIX systems frequently use UNIX-like commands. Many of the basic commands discussed in this article will be applicable to whatever system you have.

As you explore the Internet, chances are that you will use or dial into a computer system that works with the UNIX operating system. If you're only familiar with DOS or Macintosh computers, trying to use UNIX can make you feel like a stranger in a strange land.

UNIX is the most popular operating system on the Internet because it is available for a wide variety of computer platforms and has a multi-user, multi-tasking environment. This means that several people can use a UNIX computer simultaneously—and each person can run several programs at once.



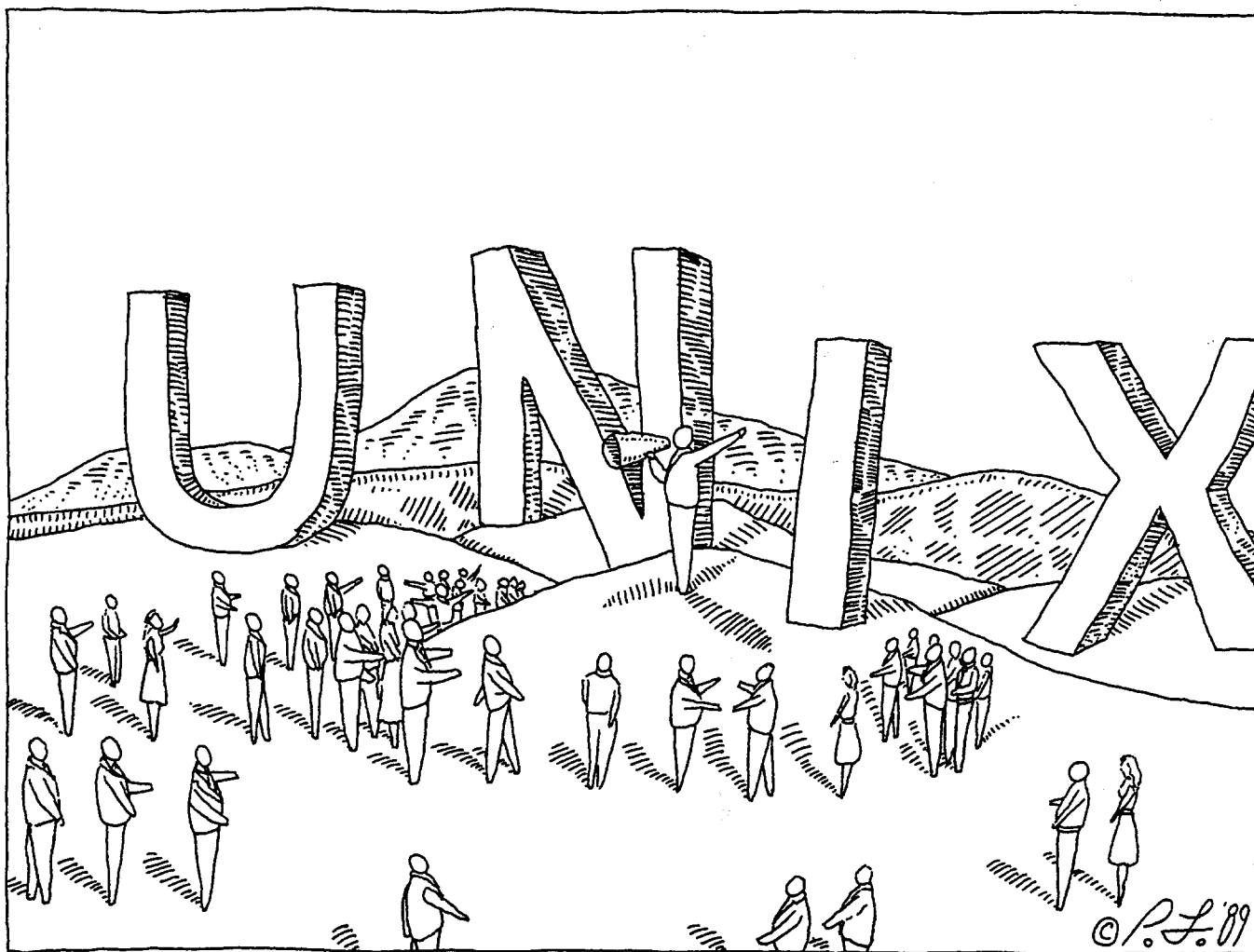
UNIX

Learning the

BY KEVIN M. SAVETZ

The system was developed in 1969 at the Bell Laboratories. Since its creation, UNIX has seen countless updates, revisions and spinoffs. Today, there are flavors of UNIX with names like SCO UNIX, BSD and System V. These versions are very similar, but it is important to know what one you're using when you have a question or are looking for a book on UNIX.

Here's the basic information you will need to use UNIX. With practice you will be able to combine commands to easily perform otherwise complex tasks.



Paul J. Fisch

Language of the Internet.....

LOGGING IN AND OUT

To access a UNIX system, you'll need the system administrator to set up your own account. When you want to get on the system, you enter your account name and a secret password. (For more on passwords, see "10 Things Not To Use As Your Password.") The computer uses this information to verify who you are, give you access to the information that belongs to you and keep other users out of your files. If you're legit, you'll see the UNIX prompt, your signal that the computer is ready to take a command.

If you use DOS, you're familiar with a prompt like (C:\>). UNIX prompts vary from system to system, but it is likely to be a dollar sign (\$) or a percentage sign (%).

When you log on, you may also see the system "message of the day" (or MOTD, pronounced mot-dee) announcing

anything the system administrator thinks you need to know. You may also see a message if you have any unread electronic mail.

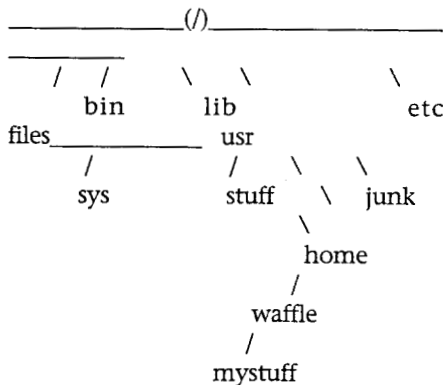
To log off the system, simply type `logout`. This is important because it tells the computer you don't plan on using it for a while and will prevent others from looking through your files.

FILES AND DIRECTORIES

If you've used another computer operating system, you are already familiar with the concepts of files and directories. Files are individual collections of information (a letter to Aunt Zelda, a picture of the moon or a game's software) stored on a computer. Directories allow you to place files in a logical manner so you can find them later. UNIX files and

directories are very similar to those on DOS computers.

Your account has a **home directory**, which is where you start by default when you log on to the system. You can change your current directory, list its contents, create new directories and remove ones that are part of your home directory. Like DOS, UNIX uses a hierarchical directory structure. This means that there is one **root directory**, and many sub-directories in which you can store files. A diagram of the structure might look like the following:



A file in the **mystuff** directory can be referred to as **/files/home/waffle/mystuff/filename**.

This is the filename's full path. The first **/** must be there for it to be a full path. If you leave it off, UNIX will look for the file starting in the your present directory. (Leaving off the **/** can be use-

ful because constantly referring to files by their full pathnames gets tedious. If you were in **waffle** and wanted to refer to **filename** in the **mystuff** directory, you could call it **mystuff/filename**. If you are already in **mystuff**, just use **filename**.)

If you use DOS on your home computer, note that UNIX uses a forward slash (**/**) between directory names instead of a backslash (****).

If you use DOS, you're also used to restrictive filenames with eight letters, a period and an extender of three more letters (for example, **GRANDMAS.LTR**). If you use a Macintosh, you have the luxury of filenames of up to 31 characters. Depending on what flavor of UNIX you're using, you may be allowed filenames from 14 to 255 characters. Unlike DOS—which only allows A thru Z, 0 thru 9 and the underline in filenames—UNIX filenames can contain just about any character you can type on the keyboard. (Some characters—the asterisk, brackets and spaces—can be used, but can also get you in sticky situations later. It's best to avoid using them.)

BASIC UNIX COMMANDS

Below are some important commands for manipulating files and directories. The first rule of UNIX: Use and love the **man** (manual) command. Typ-

ing **man cp**, for instance, will tell you everything you could want to know about the **cp** command. Type **man man** and **man intro** for general system help. Most of the following commands take special options, called arguments, for tweaking how they work. There isn't room here to list each command's options and arguments, so make judicious use of the **man** command.

pwd - Stands for "present working directory," and it will tell you in which directory you currently are. Log on to your system and type **pwd** to find out what your home directory is called.

ls - Lists all the files and directories under your present working directory. One problem: The **ls** command doesn't tell you whether you're looking at the names of files or directories. Not to worry—if you type **ls -CF**, you'll get a nicely formatted list where executable files (programs) are indicated with an asterisk and directories by a slash.

Some files in UNIX are normally invisible (hidden) files. Any filename that begins with a period—such as **.newsrc** and **.login**—isn't normally shown when you enter the **ls** command. You can see them, however, if you explicitly ask to see all files by adding the **a** argument to the **ls** command: type **ls -a** or **ls -aCF** (yes, capitalization matters!) to see your invisible files. Invisible files usually specify your system configuration—or, perhaps you simply have something to hide.

cd - Stands for change directory. You can move to a subdirectory under your present directory by typing, for example, **cd mystuff**. To move back to the previous one, type **cd ..** (That's two dots. Why two dots? It's a mystery to me.) If you know exactly what directory you want to go to, you can type a command like **cd /lib/sys**.

cp - Is an abbreviation for copy. Not surprisingly, the **cp** command lets you copy a file. Typing **cp file1 file2** will create a new copy of **file1**, called **file2**, in your present directory. Typing **cp file1/files/home/wombat** will put a copy of **file1**, still called **file1**, in the **files/home/wombat** directory. Typing **cp file1/files/home/wombat//file2** will make a copy of

UNIX VS DOS

Here are some important ways in which UNIX differs from DOS.

The DOS prompt looks like **c:\>**

The UNIX prompt looks like **\$** or **%**

DOS uses backslashes ****

UNIX uses forward slashes **/**

DOS filenames are restricted to eight letters, a period and an extension of three more letters (**GRANDMAS.LTR**)

UNIX filenames can range from 14 to 255 characters.

DOS filenames can consist only of the letters A thru Z, the numbers 0 thru 9 and the underline character.

UNIX filenames can contain just about any keyboard character.

• In UNIX, there is no "undelete" command. Once your file is gone, it's gone forever.

file1, called *file2*, in */files/home/wombat*. Whew!

mv - Is an abbreviation for move, and lets you move files around directories. Moving a file will copy that file to your specified directory and then delete the original.

rm - Stands for remove. This command will let you erase files that you no longer need. Be careful! There is no "undelete" command in UNIX. Once your file is gone, it's gone forever.

Typing **rm file2** will erase that file from your present directory. Typing **rm*** will delete every file in the directory. In UNIX, like in DOS, the asterisk means "all files".

cat - Stands for catenate, an obscure word meaning "to form a chain or series." In its most basic use, cat works just like the DOS TYPE command; it displays the contents of a text file. Actually, you can use it to display the contents of any file, but binary files (like programs and digitized pictures) will only appear as garbled data. To display a file, just type **cat letter_to_grandma** and the computer will print the letter to your screen. If the text in the file is too long, the beginning will scroll off the top of the screen faster than you can read it. Which brings us to the next command...

more - Shows you the contents of a text file one page at a time. If you type **more letter_to_grandma**, you'll see the word "more" after each screen of text. Strike the space bar when you're ready to see the next page of text. Your system may also have a program called **less**, which does the same as more, only better. As they say, less is more. :) Don't forget to type **man less** or **man more** for complete information or more options.

chmod - Can be used to change the permissions of a file, or those users who have access to a particular file. Remember that UNIX is a timesharing system that can be used by many people simultaneously. You might want to keep some of your files - for instance, your electronic mail - private, but let other users read or modify certain files. So **chmod**, which stands for "change mode," makes it possible to allow/deny yourself, all system users or only certain

users to read, write or execute your files. For more information (you saw this coming, right?) type **man chmod**.

MISCELLANEOUS COMMANDS

Here are some other commands that are important, but don't really fit in with other groups.

man - OK, I already mentioned this one, but I'm mentioning it again to make sure you know how to RTFM (read the manual). The **man** command shows you the "manual page" for a particular command. For instance, **man ls** will give you lots of information about the **ls** command.

vi or **emacs** - Are text editors or programs that allow you to create text files (such as e-mail messages, programs or letters to Aunt Zelda). If you're just starting out, try using "vi." It's not the simplest text editor available, but it's easier than emacs. In contrast, emacs is

a software behemoth that will edit files, tell your fortune and teach you how to make cookies. (Really.)

lpr or **print** - May let you print a text file on a printer connected to the UNIX computer. Two caveats: First, never try to print a non-text file—anything that looks like gibberish when viewed onscreen with the **cat** command will look worse on paper. Second, if you're working from a college computer lab or your office and know there's a printer down the hall, feel free to use the **print** command. However, if you're using a dial-up UNIX system—and the main terminal is hundreds of miles away—don't use the printer unless you intend to drive there to pick up your printout!

grep - Stands for "global regular expression print," which is a verbose way of saying that this program will search through files and output any lines that containing text you specify. If you've ever read Usenet news, your home directory contains a hidden file called **.newsr** which lists all the newsgroups available to you. Typing **grep**

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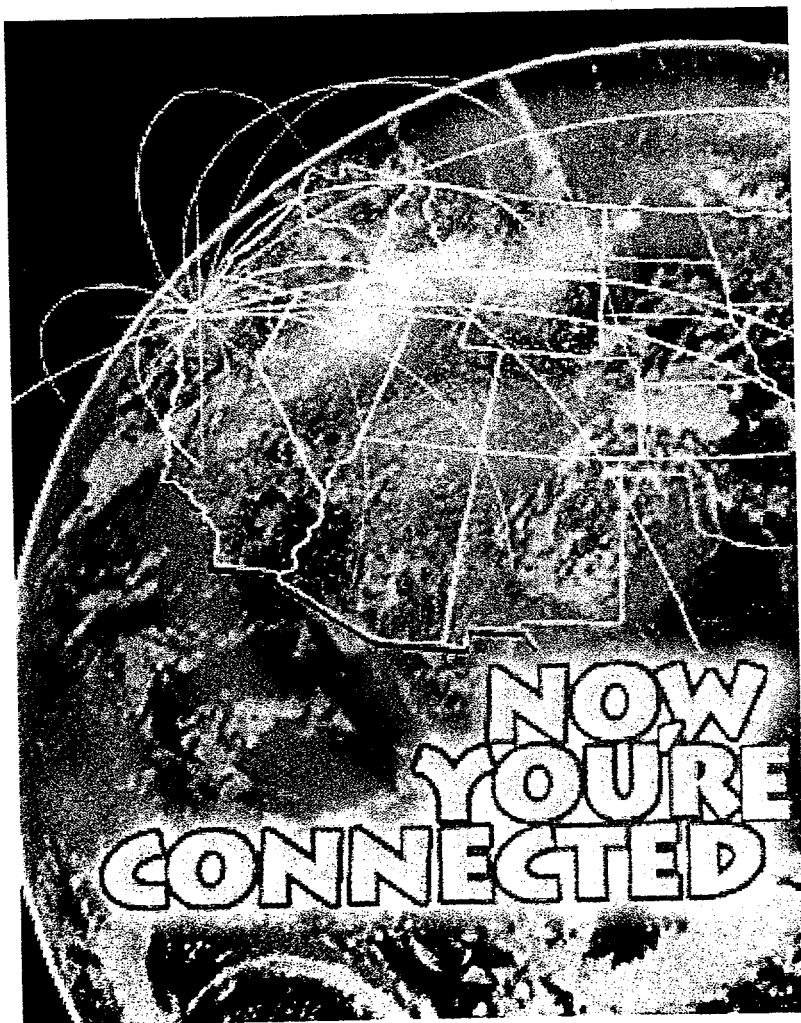
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`amiga.newsarc` will list all the lines in the file that contain the word "amiga."

`passwd` - Allows you to change your password. Typing `passwd` will prompt you for your old password then ask you to type your new password twice. Passwords you type should never be visible on your screen.

`compress` and `uncompress` - Are a pair of programs that will compress or decompress the file (or files) of your choice. Compressed files end in the extension ".Z" and take up less disk space than uncompressed ones. Many of the files available via the Internet's ftp program are compressed to save space and reduce transfer time. Similar to .zip files on a DOS computer and .sit files on a Macintosh, UNIX's compressed files take up relatively little space. But, they aren't useful until they've been uncompressed. To use these commands, just type `compress filename` or `uncompress file name.Z`.

FOR MORE INFORMATION

This article has just given you enough information about UNIX to be dangerous. UNIX is a complex operating system made up of hundreds of commands, oddball nomenclature and countless little quirks. Don't worry—the Internet is rife with beginner's information about UNIX. To explore more of the basics, check out one of the following:

- The UNIX Frequently Asked Questions list. This huge, seven-part list of questions and answers explores the ins and outs of UNIX. Users of all knowledge levels will learn something from this file. It is available via FTP as `rtfm.mit.edu:/pub/usenet/news.answers/unix-faq/faq/part1` (as well as part2 through part7.)
- The `comp.unix.user-friendly` Frequently Asked Questions (FAQ) list, available via anonymous FTP from `ftp.wfu.edu:/pub/usenet/cuuf-faq`.
- A Concise Guide to UNIX Books. This lists contains selections of the best books and documentation on UNIX

and related subjects (such as UNIX editors and shells.) It's obtainable via anonymous ftp from `rtfm.mit.edu:/pub/usenet/news.answers/books/unix`. If you do not have FTP access you can get it by sending e-mail to `mail-server@rtfm.mit.edu` with a message body of `send usenet/news.answers/books/unix`.

- The Usenet newsgroups `comp.unix.user-friendly`, `comp.unix.questions`, `comp.unix.shell` and `news.answers`

If you prefer learning from traditional books, rent a forklift for your return trip from the library or bookstore. Dozens of fine UNIX books abound. Be sure that the book you pick is tuned to the version of UNIX you use (for instance, System 7 or BSD.) If you're not sure which book to read, start with one of these:

- *Learning the UNIX Operating System*, 3rd edition, by Grace Todino, et al. Published by O'Reilly & Associates, ISBN 1-56592-060-0. An introduction to UNIX, including information on electronic mail, networking and X-Windows. Geared toward users who need to better understand UNIX to make the most of the Internet.

- *UNIX for Dummies* by John Levine and Margaret Levine Young. Published by IDG, ISBN: 0-878058-58-4. An informal and non-technical introduction to UNIX.

- *Exploring the UNIX System*, 2nd edition, by Stephen Kochan and Patrick Wood. Published by Hayden books. ISBN: 0-672-48447-1. A basic overview of UNIX structure and commands from the ground up. (This was my first UNIX book.)

- *A Student's Guide to UNIX* by Harley Hahn. Published by McGraw Hill. ISBN: 0-07-025511-3. In a clear and lively language, the author tells novice users everything they need to know about UNIX and the Internet. The book covers commands, utilities, shells, vi, X-Windows, e-mail, and other topics.

- *UNIX in a Nutshell* by Daniel Gilly. Published by O'Reilly & Associates. ISBN: 1-56592-001-5. A complete reference guide containing all UNIX com-

mands and options, along with lots of examples and descriptions of the commands. Versions for System V releases 3 and 4 and Solaris 2.0, SCO UNIX and BSD systems are available. ■

10 THINGS NOT TO USE AS YOUR PASSWORD

On any Internet system, not just UNIX, your password is the only thing standing between you and disaster. If someone should guess your password, he or she will be able to read your electronic mail, snoop in your files, delete your work and post electronic mail or Usenet news messages that will appear to come from you. That can be embarrassing, annoying and dangerous.

UNIX systems use a tricky feature called one-way password encryption. When you first choose a new password, the computer encrypts your password—so thoroughly that it can never be decrypted—and only stores the encrypted version. Later, when you type your password while logging in, the computer encrypts your guess using the same method and compares the encrypted version of your guess to the encrypted version of your actual password. If they match, you're allowed in.

Although your password can't be decrypted, you're never perfectly safe. Unscrupulous crackers can use the encryption routine to stab guesses at your password. At least one computer program is available that can quickly and silently encrypt every word in the dictionary and compare it to the list of encrypted passwords on your system. Therefore, if your password is in the dictionary, you can get zapped.

A variety of other passwords that aren't in the dictionary are also bad choices because they're very easy to guess. The following is a partial list of words that should not be used as passwords.

- password
- opensaysme
- letmein
- your initials
- your login name
- your cat's name
- your spouse's name
- any information that can be found by looking up your account name on the system, such as your phone number, name, etc.
- any word that's in the dictionary

To be as safe as possible, make your password a bunch of unrelated characters, such as `K#*2ww>`. Use a combination of upper and lower case letters, punctuation and numbers. If you find this type of password too hard to remember, try using two unrelated words separated by a punctuation mark, like `explore*grasshopper`.

Kevin Savetz is a computer journalist based in Arcata, California. He believes that UNIX is more afraid of you than you are of it. Kevin can be reached via e-mail at `savetz@rahul.net` (Internet) and Savetz on America Online.

`savetz@northcoast.com`

Suggested Readings on UNIX

Teach Yourself UNIX in a Week

by Dave Taylor

SAMS Publishing

0-672-30464-3

\$28.00

UNIX Unleashed

Sams Publishing

0-672-30402-3

\$49.99

UNIX in a Nutshell

O'Reilly and Associates

1-56592-001-5

\$9.95

UNIX for DOS and Windows Users

by Kevin Reichard

MIS: Press

1-55828-361-7

\$19.95

End of Presentation

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Macintosh Toolbox

THESE GEMS WILL GIVE
YOUR NET LIFE A LIFT.
BY KEVIN SAVETZ



The hard disk of my Macintosh is overflowing, but I can't complain because I'm the only one to blame. For instance, take my Internet folder (please!). This little trove of tools that work with my SLIP and PPP Internet connections weighs in at just over 20MB. Yow!

Macintosh users probably are familiar with most of the software that resides in that directory. There's the freeware version of Eudora, Mosaic, NSCA Telnet, TurboGopher, Fetch, and a variety of other essential wares. I consider these the staples of Macintosh Internet connectivity. These tools provide the basic functions you need to send e-mail, obtain files, and access Gopher and the World-Wide Web.

My toolbox, however, runneth over. The sheer bulk of my Internet directory betrays the secret that my computer harbors more than these essential Internet tools. Those 20MB hold some unique, almost magical tools that make my life on the Internet so much the better. These programs are just as wonderful as the Big Five tools listed above, but are perhaps

only less known, or for some unfathomable reason, less popular (at least, so far).

So I've filtered through the goodies in my Internet toolbox and will share with you some of the tools that you may not have used but should definitely try. Perhaps you've gotten along just fine without any of these programs

for months. Maybe you didn't think that something as simple as sending e-mail or grabbing a file from an anonymous FTP archive could be any simpler. But these programs do it better. Or possibly one of these tools does a task that you never really considered. Check out these programs. If you like enough of them, your Internet folder too can top 20MB.

Anarchie

Move over, Fetch, Anarchie is here. Anarchie (pronounced "anarchy") is one of the best ideas I've seen yet in an Internet tool. I can't believe someone didn't think of this long ago. Anarchie effortlessly combines the functions of FTP (the Internet's tool for

moving files around the Net) and Archie (a tool that finds programs available via FTP). These are normally two separate functions, but they are blended seamlessly with this program.

Simply type in the name of a program and Anarchie will find it for you using one of two dozen Archie servers. The next part is the real magic: When Anarchie presents

Archie

Server:

Find:

☐ Sub-string (dehqn) ☐ Case sensitive

☒ Pattern (dehqn*.hqx)

maelstrom from archie.uqam.ca

Name	Size	Date	Zone	Host
maelstrom-14-updt.hqx	88k	12/7/93	1	sunex-sim.stanford.edu
maelstrom-14-updt.hqx	88k	12/7/93	5	plaza.aarnet.edu.au
maelstrom-14.hqx	1058k	12/7/93	1	sunex-sim.stanford.edu
maelstrom-14.hqx	1058k	12/7/93	5	plaza.aarnet.edu.au
maelstrom-combo.hqx	950k	6/8/93	1	sunex-sim.stanford.edu
maelstrom-combo.hqx	950k	6/10/93	5	plaza.aarnet.edu.au
maelstrom-funky-sounds-12.hqx	352k	6/30/93	1	sunex-sim.stanford.edu
maelstrom-funky-sounds-12.hqx	352k	7/2/93	5	plaza.aarnet.edu.au
maelstrom-martin-sounds.hqx	647k	6/14/93	1	sunex-sim.stanford.edu
maelstrom-martin-sounds.hqx	647k	6/15/93	5	plaza.aarnet.edu.au
maelstrom-simpson-sounds.hqx	785k	6/1/93	1	sunex-sim.stanford.edu
maelstrom-simpson-sounds.hqx	785k	6/3/93	5	plaza.aarnet.edu.au
Maelstrom.bin	566k	1/15/93	1	princeton.edu
maelstrom1.40.hqx	1058k	12/7/93	5	plaza.aarnet.edu.au

Maelstrom.hqx

Host: princeton.edu

Status: Getting

State: Transferring

Transferred: 113958 Bytes/Sec: 1499 Time Left: 7:55

227 Entering Passive Mode (128,112,128,1,4,254)

ANARCHIE MERGES SEARCH AND DOWNLOAD FUNCTIONS.

a list of hits, just double-click on one of them and it will FTP that file right to your machine—and automatically decompress for you. It sure beats the old two-step process of doing an Archie search, then (once you find the object of your desire) initiating an FTP session. Anarchie is instant gratification, or as close as I can get with my 14.4 Kbps modem.

In addition, Anarchie is fully compatible with AppleScript, which is great for automating FTP transactions. If you use System 7.5, you can take advantage of its extra features, including a detailed Apple Guide.

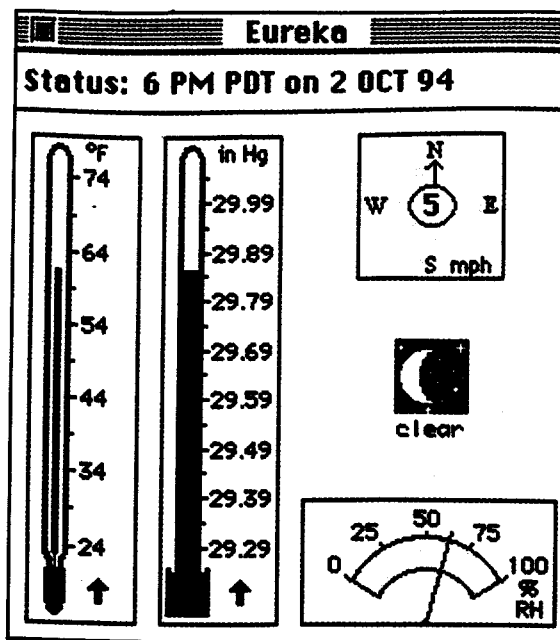
Anarchie is shareware (\$10) available via FTP from all the usual suspects—er, sites—like aim.stanford.edu and mac.archive.umich.edu. You also can find it at nic.switch.ch/mac/software/peterlewis/, amug.org/pub/peterlewis/, and redback.cs.uwa.edu.au/others/peterlewis/.

Maven

Maven has my vote for the Internet tool with the most potential to change how we use the Internet. Remember how Mosaic changed the way people used the Net? I predict that, in time, Maven could be the next killer app of the Internet. Not because it delivers elegant color graphics to your screen (it doesn't), but because it could one day nullify your long-distance telephone bill.

Maven is an audioconferencing tool that transmits sound over the Internet. That's right, you can plug a microphone into your Mac and chat away with people hundreds of miles away. Of course, there's a catch: Maven is a bandwidth hog. Even in its lowest-quality sampling mode, it still requires just a little bit more bandwidth than a 28.8 Kbps modem can give you. If your office has a 56 Kbps connection, you might try hogging most of that with Maven. If your mom in Cleveland has a similar Internet connection, you might be able to talk to her for free.

Maven can talk to other Macs running Maven, as well as the Unix Vat audio program. Maven's creator is working on adding better compression algorithms to the program, which means that perhaps soon Maven audio will require less bandwidth to work effectively. You



MACWEATHER SPORTS EASY-TO-READ GRAPHICS.

can get Maven via FTP in k12.cnidr.org/pub/Mac. Until, of course, AT&T finds out about this.

MacWeather

If you've been on the Internet for longer than 20 minutes, you've probably heard of the University of Michigan's Weather Underground, a tool for getting info about the current weather and forecasts. MacWeather puts a new face on the Weather Underground, using (rather than plain text) graphical weather symbols we're familiar with, like an on-screen barometer, thermometer, and weather vane. When you start up MacWeather, it

quickly tells you the weather in your favorite city. And it's easy to point at any of dozens of cities for a quick look at what Mother Nature has in store.

For cities in the United States and Canada, local forecasts are automatically downloaded along with the current weather conditions. Near-shore marine forecasts are available for coastal United States cities, as is climate data. MacWeather is available via FTP at mac.archive.umich.edu and aim.stanford.edu.

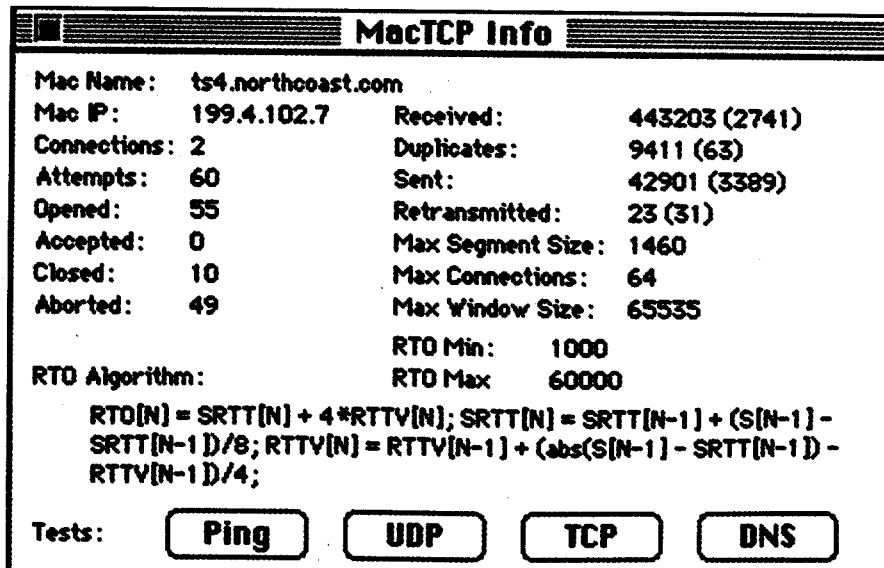
MacTCP Watcher

Although it's not the sexiest program out there—I mean, it won't fold your laundry, sort your files, or mix drinks—MacTCP Watcher gets my vote for best troubleshooting tool. Written by the same fellow

who brought us Anarchie, MacTCP Watcher can tell you how your Mac is passing packets, help you ping other machines on the Net, and test your domain name server.

To obtain assorted Macintosh tools, FTP to :

- ftp.ncsa.uiuc.edu
- ftp.tidbits.com
- ftp.tidbits.com/pub/tidbits/tisk
- ftp.tidbits.com/pub/eudora
- boombox.micro.umn.edu
- mrcnext.cso.uiuc.edu/pub/info-mac/comm/MacTCP
- wardrive.wustl.edu/systems/mac/umich.edu/wtl/comm



MACTCP WATCHER DOES EVERYTHING BUT CHECK OIL.

MacTCP Watcher displays the internal data of MacTCP operations. It shows the Mac's IP address, DNS name, and all the other information that MacTCP provides. It will also list all of your open TCP connections and information about each of them. It's excellent at reporting problems. For instance, if reverse domain-name lookup isn't working (an obscure but annoying problem), MacTCP Watcher will tell you about it. The program is useful if you are having MacTCP configuration troubles or are just (as the author is) chronically curious.

You can find MacTCP Watcher via FTP at [nic.switch.ch /mac/software/peterlewis/](ftp://nic.switch.ch/mac/software/peterlewis/), [amug.org /pub/peterlewis/](ftp://amug.org/pub/peterlewis/), and [redback.cs.uwa.edu.au/others/peterlewis/](ftp://redback.cs.uwa.edu.au/others/peterlewis/).

Eudora

Eudora is hardly an obscure program. On the contrary, I'm willing to bet it's the single most popular mail program for the Mac (and Windows). But perhaps you were not aware that there are two versions of Eudora—a free version and the commercial one. If you did know this, perhaps you haven't considered shelling out money for something you already have for free. I didn't think that the free Eudora could be improved, but the commercial version offers a variety of strong features that are definitely worth the cash you would shell out.

My favorite feature by far is Eudora's ability to spell-check e-mail before I send it. I quiver at the thought of what my messages must have looked like before I started using the new Eudora. It has caught dozens of typos that would have otherwise gone unnoticed by me (but would likely have been noticed by my correspondents).

APPLE PICKS SOME WINNERS

On September 30, Apple Computer gave awards to eleven individuals and organizations whom it deemed critical players in creating a wide variety of Internet tools for the Macintosh. Each of the following winners of the Cool Tools award (yes, that's really what it's called) received a certificate and a PowerMac 7100:

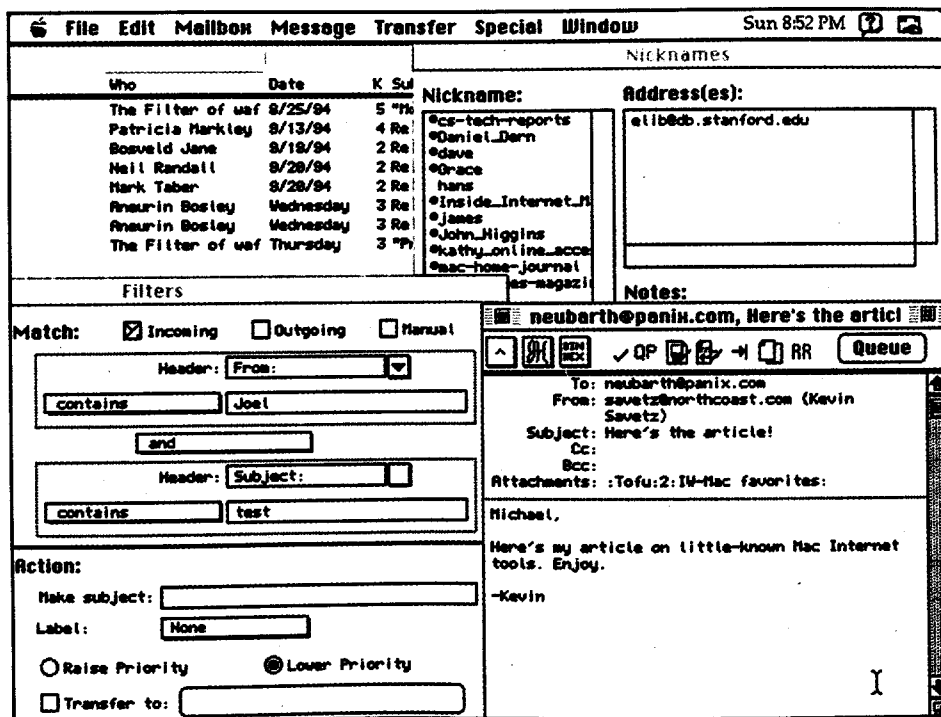
- The Internet Society of Reston Virginia (for its overall contribution).
- Steve Dorner of QUALCOMM (for Eudora).
- Chuck Shotton from Houston, Texas (for MacHTTP, a World-Wide Web server).
- Peter Lewis of Perth, Australia (for FTPd and Anarchie).
- The University of Michigan, Weather Underground (for Blue-Skies).
- John Hardin of EInet, Austin, Texas (for MacWeb).
- National Center for Supercomputer Applications in Urbana, Illinois (for Mosaic).
- Aaron Giles of Cornell University Medical College, New York (for JPEGView).
- John Norstad of Northwestern University, Evanston, Illinois (for Newswatcher).
- Cornell University, Ithaca, New York (for CU-SeeMe).
- University of Minnesota at Minneapolis, MN (for TurboGopher, a gopher browser, and GopherSurfer, a gopher server).

Eudora 2.1 can automatically encode and decode BinHex and uuencoded binary files. It can handle return receipts and has a snazzy tool for filtering your messages (for example, by automatically moving mail from a high-volume mailing list to a special folder, or marking messages

from your sweetheart in red letters). It handles multiple signatures, expanded nickname functions (for quickly sending one message to a group of people), and too many other nice tweaks to mention here. Executive summary: It's a winner.

Eudora from Qualcomm is \$65 (\$99 with the spell-checker option). You can get information via FTP (and pick up the free version of Eudora) at [ftp.qualcomm.com](ftp://ftp.qualcomm.com), or call Qualcomm at 800-2-EUDORA.

Kevin Savetz (savetz@northcoast.com) is author of *Your Internet Consultant—the FAQs of Life Online* (Sams Publishing, 1994) and co-author of *Internet Press, a free guide to on-line journals about the Internet*. For a copy, send e-mail to savetz@northcoast.com with "send ipress" in the subject line.



EUDORA'S MULTIPLE FEATURES MAKE E-MAIL A BREEZE.

FALL INTERNET WORLD

MACINTOSH INTERNET TOOLS

SOURCES

Current versions of most of these applications are available for downloading via:

<http://www.northcoast.com/savetz/iwmactools.html>

Many of the applications whose source sites are listed here are also available in recent versions from <ftp://ftp.scs.unr.edu/pub/macintosh/tcp-connections>, the various Info-Mac mirror sites and from the Tidbits archive at <ftp://ftp.tidbits.com/pub/tidbits/select/>.

All the path information has been recently checked to be sure it's as accurate as possible, but changes occur frequently, so you may encounter variations.

Some, but not all, of these applications have "fat" binaries, or native versions for PowerMacs. Many are free or have free versions. However, others are shareware or commercial software, and you should consider registering if you use a copy on a regular basis.

TELNET

The basic Internet tool that lets you connect and login to remote computers from your desktop. Free from the National Center for Supercomputing Applications. A new beta version of Telnet 2.7 is now available which supports drag and drop, and which has smoothed out some rough edges from earlier versions.

NCSA Telnet for Macintosh, Version 2.6 and 2.7b4 (Beta)

<http://www.ncsa.uiuc.edu/SDG/Software/Brochure/MacSoftDesc.html>

<ftp://ftp.ncsa.uiuc.edu/Mac/Telnet/Telnet2.7/>

FTP

FTP lets you place and retrieve software and files from remote computers. Fetch is easy to learn and use. Anarchie combines an FTP client with an Archie client, which helps you hunt down software and files across the net. Anarchie is shareware and comes with a comprehensive set of bookmarks for Internet software archives.

(FTP, Continued)

Fetch, Version 2.1.2 and 3.0b6 (Beta)

<ftp://ftp.dartmouth.edu/pub/mac>

Anarchie, Version 1.0.6

<ftp://cadadmin.cadlab.vt.edu/pub/peterlewis/>

E-MAIL

Eudora 1.5.3 is a freeware version of the commercially available POP (Post-Office-Protocol) client for e-mail, that lets you bring your Internet e-mail from your Internet provider down to read on your Mac.

Eudora, Version 1.5.3

<ftp://ftp.qualcomm.com/quest/mac/eudora/1.5/eudora153.hqx>

Claris Emailer is commercial software, but a demo version is available on the net. The big thing about Claris Emailer is that it can check email on Internet, AOL, eWorld, Compuserve and RadioMail.

Claris Emailer, Demo Version

<http://www.claris.com/Products/ClarisEmailer/index.html>

If you read your mail from more than one place, POP mail can be limiting. Mail Drop uses the more sophisticated IMAP protocol, which allows you to store and manipulate your mail on the remote mail host. This still has some rough edges, and is under development, but the advantages make it worthwhile, if IMAP is something you need.

Mail Drop Version 1.1

http://ackmo.baylor.edu/files/Mail_Drop/Mail_Drop.hqx

VideoMail is a marriage of multimedia and the Internet. It uses audio and video capturing equipment to produce QuickTime movies. These movies can then be sent to one or more people using Simple Mail Transfer Protocol (SMTP).

VideoMail Version 1.0

<http://www.spyglass.com/~dtrinka/videomail.html>

GOPHER

A classic Internet browsing tool, Turbogopher is speedy and reliable. The newest versions are aware of non-gopher protocols and can hand off information to other clients, including World Wide Web browsers. A 3-D version is in development but is still highly experimental. As the developers themselves say, "use at your own risk."

TurboGopher, Version 2.0

<ftp://boombox.micro.umn.edu/pub/gopher/Macintosh-TurboGopher>

Gopher VR, Version 2.1a4

<ftp://boombox.micro.umn.edu/pub/gopher/Macintosh-TurboGopher/TurboGopherVR/>

WAIS

A nice shareware implementation of a WAIS (Wide Area Information Service) client, MacWais helps make searching Internet databases easier. However, unreliability of the public servers can sometimes make this frustrating to use.

MacWais, Version 1.29

<ftp://ftp.einet.net/einet/mac/>

USENET NEWSREADERS

For keeping up on USENET newsgroups, there are several nifty newsreaders. Braddlee likes InterNews; Kevin is a fan of NewsWatcher.

InterNews, Version 1.1

<ftp://ftp.dartmouth.edu/pub/mac>

NewsWatcher, Version 2.0

<ftp://ftp.acns.nwu.edu/pub/newswatcher/>

Nuntius, Version 2.0.4

<ftp://frederik.ruc.dk/pub/nuntius/>

WORLD WIDE WEB BROWSERS

Netscape has taken the Internet by storm. Version 1.12 is commercial software which is free for individual evaluation and educational use. Mosaic, which helped to create the original wave of excitement over the Web, has a new completely free version available, but it's buggy and doesn't support some of the newer HTML codes. MacWeb works well in conjunction with TurboGopher and MacWais, but has simply not kept up.

NCSA Mosaic for Macintosh, Version 2.0.1
<http://www.ncsa.uiuc.edu/SDG/Software/MacMosaic/>

Netscape, Version 1.12
<http://www.netscape.com/comprod/mirror/mac/>

MacWeb, Version 1.1.1E
<ftp://ftp.einet.net/einet/mac/macweb>

IRC (INTERNET RELAY CHAT)

IRC is the ultimate network time killer; Homer is a IRC client *par excellence*. Easy to use, it's also a widget-lover's dream, even including support for the Speech Manager text-to-voice Mac extension.

Homer, Version .94
<ftp://mirrors.aol.com/pub/info-mac/comm/tcp/homer-094.hqx>

DESKTOP VIDEO

The availability of the Connectix Quickcam (a software-supported video camera for the Mac priced under \$100) has done a lot to increase the popularity of this new area of Internet exploration. Maven (below) is incorporated into recent versions of Cu-SeeMe, and will support audio for ethernet-connected Macs.

CU-SeeMe, Version 0.83b2
<http://cu-seeme.cornell.edu/>

DESKTOP AUDIO

Maven and Netphone are utility programs that allow you to transmit real-time audio over the Internet. Maven is now built-in to Cu-SeeMe, but is also available as a separate freeware program. Maven will not work over a dial-up connection. NetPhone is commercial software, available in a crippled demo version on the net, and will work over dial-up lines.

Maven, Version 2.0d23
<http://ux2.cso.uiuc.edu/~kline/>

Netphone, Version 1.2.3 (demo)
<http://www.emagic.com/>

RealAudio can be used as a stand-alone program or as a WWW helper application to support one-way client-server audio transmission. RealAudio can play back audio files on the fly, eliminating the long wait to download big audio files.

RealAudio
<http://www.realaudio.com>

PGP fone is the next wave in Philip Zimmerman's revolution to bring privacy to the masses. It uses sophisticated public-key encryption technology to provide secure phone conversations, in much the same way PGP does for electronic mail. Currently works with a modem and phone line -- an Internet version is coming soon.

PGPfone, Version 1.0b4 (beta)
<http://web.mit.edu/network/pgpfone>

WEATHER

MacWeather is a compact weather utility that provides useful weather info in an attractive package. Blue Skies goes more in-depth and is a modified gopher client, intended for teaching K-12 students about meteorology.

MacWeather, Version 2.0.4
<ftp://mojo.ots.utexas.edu/pub/mac/tcpip/>

Blue Skies, Version 1.1
<http://www.umich.edu:80/group/itd/archive/Public/html/mac/util/comm/gopher/>

NETWORK UTILITIES

Mac versions of the popular Unix/network tools. Internet Config is a step towards one-time setup of all your Internet applications, although support for it is far from universal. Finger allows you to check account information for Internet users, Fingerd allows your Mac to respond to finger requests. Talk supports a split screen chat session from your Mac to another Internet host, Talkd lets your Mac respond to requests to talk from other hosts. MacTCP Watcher is a collection of useful, albeit geeky, debugging tools, including Ping and DNS nameservice checking. MacTCP Switcher permits multiple IP's for Macs that travel between ethernet and PPP connections.

Internet Config, Version 1.1

<ftp://cadadmin.cadlab.vt.edu/pub/peterlewis/internet-config-11.hqx>

Finger/Fingerd, Version 1.3.7

<ftp://cadadmin.cadlab.vt.edu/pub/peterlewis/>

Talk/Talkd, Version 1.1.1

<ftp://cadadmin.cadlab.vt.edu/pub/peterlewis/>

MacTcp Watcher

<ftp://cadadmin.cadlab.vt.edu/pub/peterlewis/>

MacTCP Switcher

<ftp://mirrors.aol.com/pub/info-mac/comm/tcp/mactcp-switcher-11.hqx>

MacTcp Monitor

<ftp://mirrors.aol.com/pub/info-mac/comm/tcp/mactcp-monitor-10d30.hqx>

PGP

PGP is a freeware, public-key encryption program for the Mac and many other platforms. You can use it to safely encrypt e-mail and other files for secure transmission over the Internet. Because of export and license restrictions, it is not available except at net-dist ftp site at MIT. Be sure to read and follow the directions at the FTP site. The Mac version is comparatively easy to use, but still not painless.

(PGP, Continued)

PGP, Version 2.6.2

<http://web.mit.edu/network/pgp.html>

PPP/SLIP

PPP stands for Point-to-Point-Protocol, a neat system which allows you to run TCP/IP over conventional phone lines using a modem (14.4 bps or above is highly recommended). PPP has rapidly replaced SLIP, so if you have a choice, choose PPP. MacPPP was developed by Merit, Inc., in Ann Arbor, MI, and is freeware.

MacPPP, Version 2.1sd

<http://www.umich.edu:80/group/itd/archive/Public/html/mac/util/comm/>

SLIP stands for Serial Line Internet Protocol, an earlier version of the same sort of nifty trick that PPP also does. PPP offers somewhat greater security and efficiency than SLIP does, so if you have a choice, use PPP. InterSlip is commercial software, but demos are available via FTP from Intercon. MacSlip is another commercially available package, but is not available directly on the net.

InterSLIP, Version 1.0.1

<ftp://ftp.intercon.com:intercon/sales/InterSLIP/>

INTERNET SERVER SOFTWARE

Macs can make good to excellent Internet servers, depending on their use and how they are managed. Three of the most common uses are World Wide Web (MacHttp), Gopher (GopherSurfer) and FTP (FTPd)

MacHTTP, Version 2.2

http://www.biap.com/machttp/machttp_software.html

GopherSurfer

ftp://boombox.micro.umn.edu/pub/gopher/Mac_server/GopherSurfer1.1b3r2.sea.hqx

FTPd

<ftp://cadadmin.cadlab.vt.edu/pub/peterlewis/FTPd-300.sit>

That's all, folks!

Authors: Braddlee (braddlee@nevada.edu)
Kevin Savetz (savetz@northcoast.com)

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End of Presentation

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***Real Time Internets for
Business and Entertainment***

Martin L. Schoffstall

Sr VP & CTO

PSINet

schoff@psi.com

Current Internets Provide



- **Universal IP for dialup PC's to T3 connected ServerFarms,**
- **An enormously complex world wide topology,**
- **A platform that supports the old Internet application models (such as client server, unicast),**
- **Textual applications and limited graphical applications (Web) support.**

Current Internets Don't Provide



- **Bandwidth Commitments**
- **Latency Guarantees**
- **Prioritization**
- **Security**

- **The current operation is more like US Postal Service First Class Mail**
 - when it works it is extremely cost effective
 - when it doesn't - there is frustration (minimally)

What Is Needed Today



- Latest Internet Applications need an additional operational model for the current Internet
- The Real-Time Internet Needs to Support Rich Media:
 - Audio
 - Video
 - 3D Graphics, etc.
- It needs to support newer corporate applications:
 - real-time document conferencing, etc
- It needs to support gaming
- PSINet can support these needs today.



■ **Think of FEDEX as a metaphor**

■ **Minimally:**

- **Guaranteed Delivery**
- **Prioritized Delivery**
- **Delivered by a certain time**



**The Real Time Internet Becomes Interactivity
Platform for all corporate and consumer
applications**

Bandwidth == Rich Media

Low Latency == Interactive Media

TCP/IP+ == Uniform Programming Platform

Internet == Leveraged Distribution Mechanism



■ Centralized Resources and Proprietary Architectures

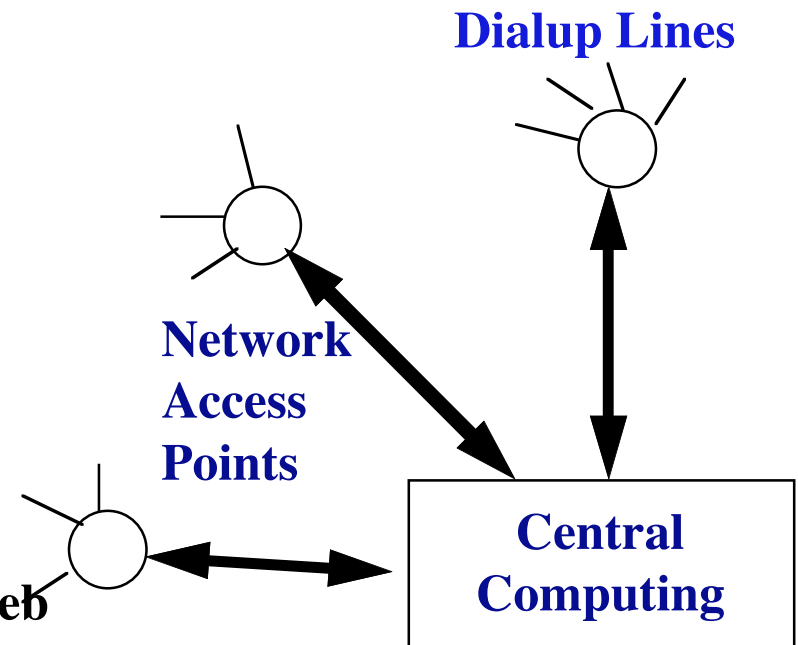
- terminal to mainframe architecture
- centralized communications
- proprietary protocols

■ High Latency Networks

- whether X.25 or “Router Only” networks
- are poor for interactive applications

■ Caching Won't Work

- while it somewhat works for the current Web
- interactive voice, audio, gaming, etc. are not suited well for caching since the information is highly variable





Applications

What we really use.

IP

Where the routers are - Universal Programming

ATM/FR

Where we guarantee interactivity.

- We layer IP Routers over ATM/FR Switches in the worldwide Internet
- We Configure Specific Servers and Routers to take advantage of it
- Then we guarantee: latency, priority, bandwidth to the current installed base and current application models

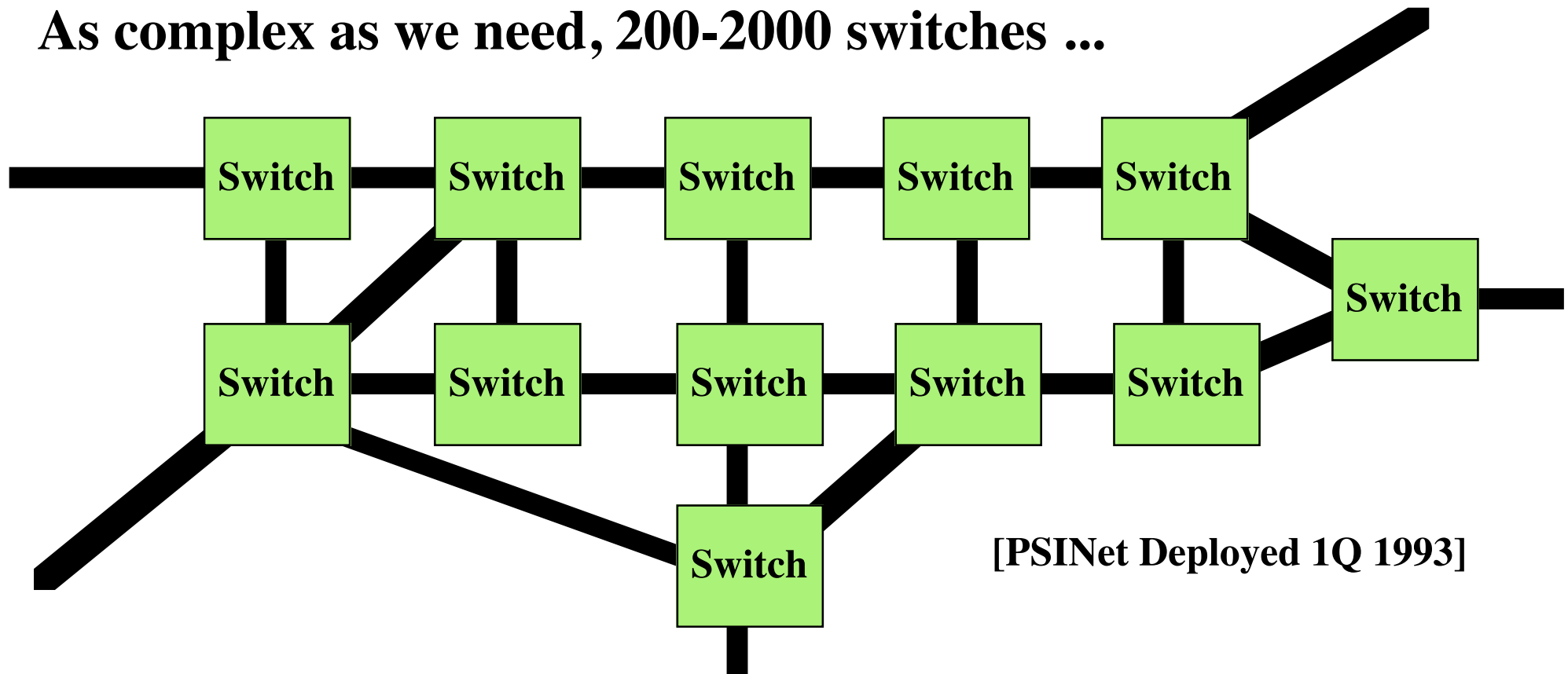


- **PSINet Technology allows virtual Internets to be created within the PSINet switching fabric.**
- **Not only applications can be managed and prioritized but so can the virtual Internets.**
- **Advances in network management and delivery on any virtual Internet benefits all virtual networks within PSINet.**
- **Customers may participate in one or more Internets.**

We Build the ATM/FR Fabric



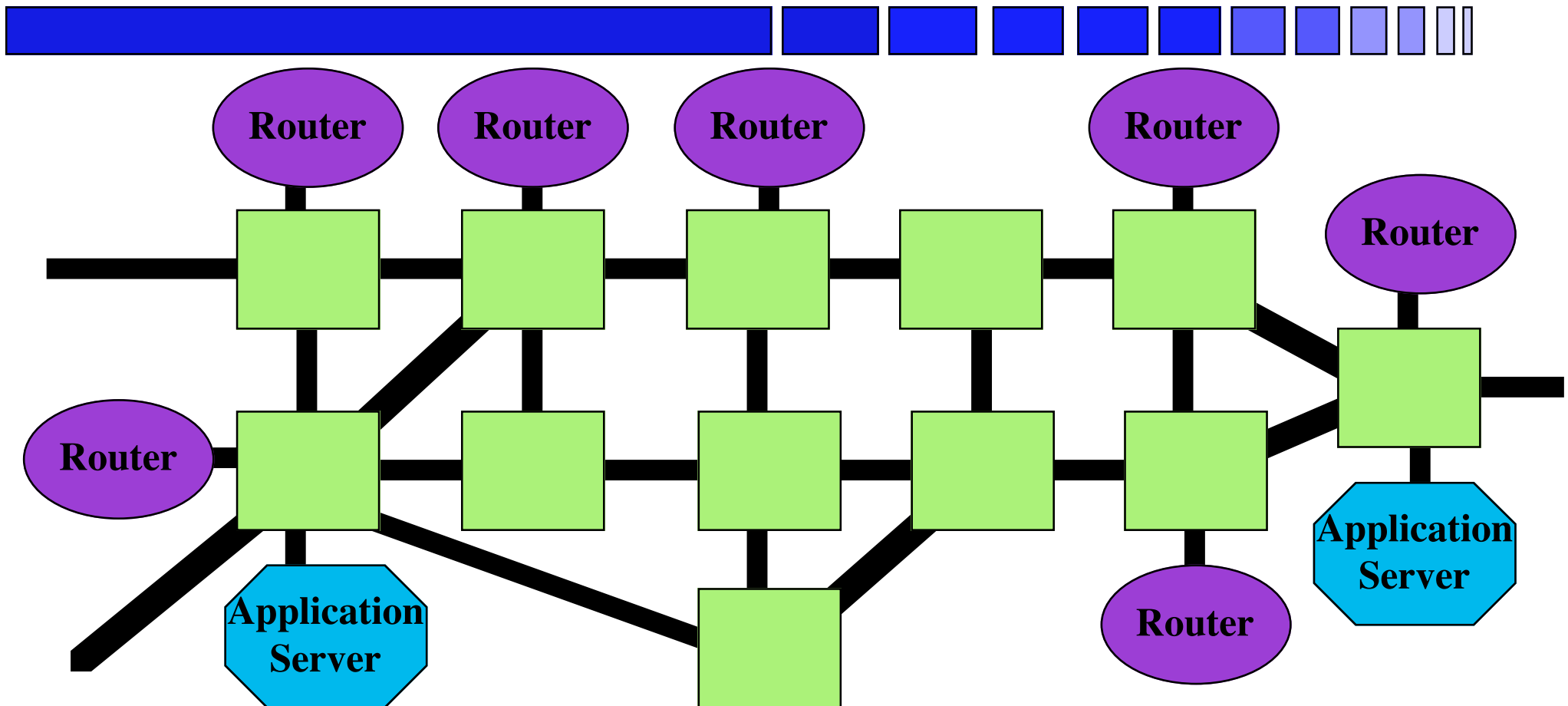
As complex as we need, 200-2000 switches ...



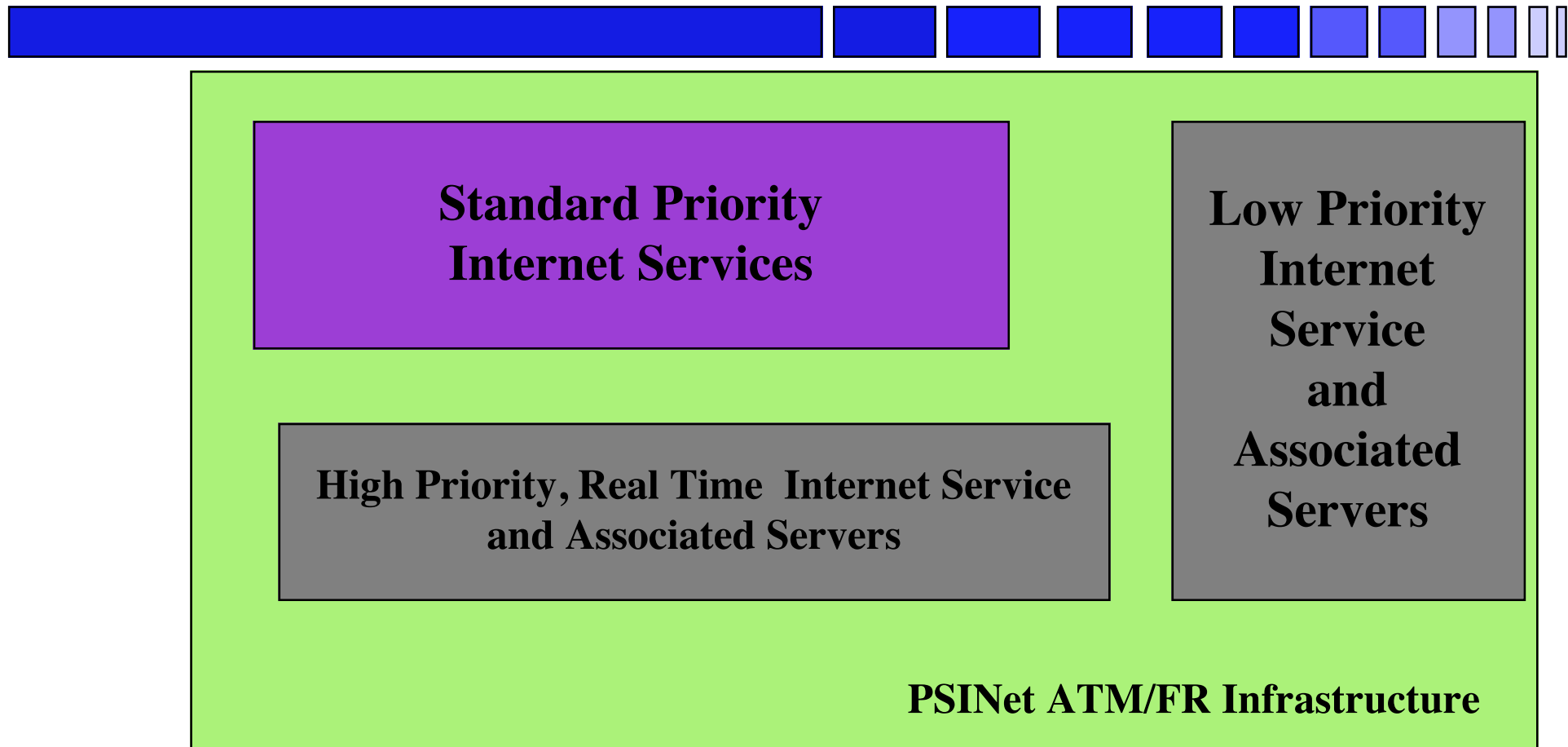
[PSINet Deployed 1Q 1993]

Which Exclusively move the Bits - Faster than Routers. Page - 10

Add the Routers and Servers

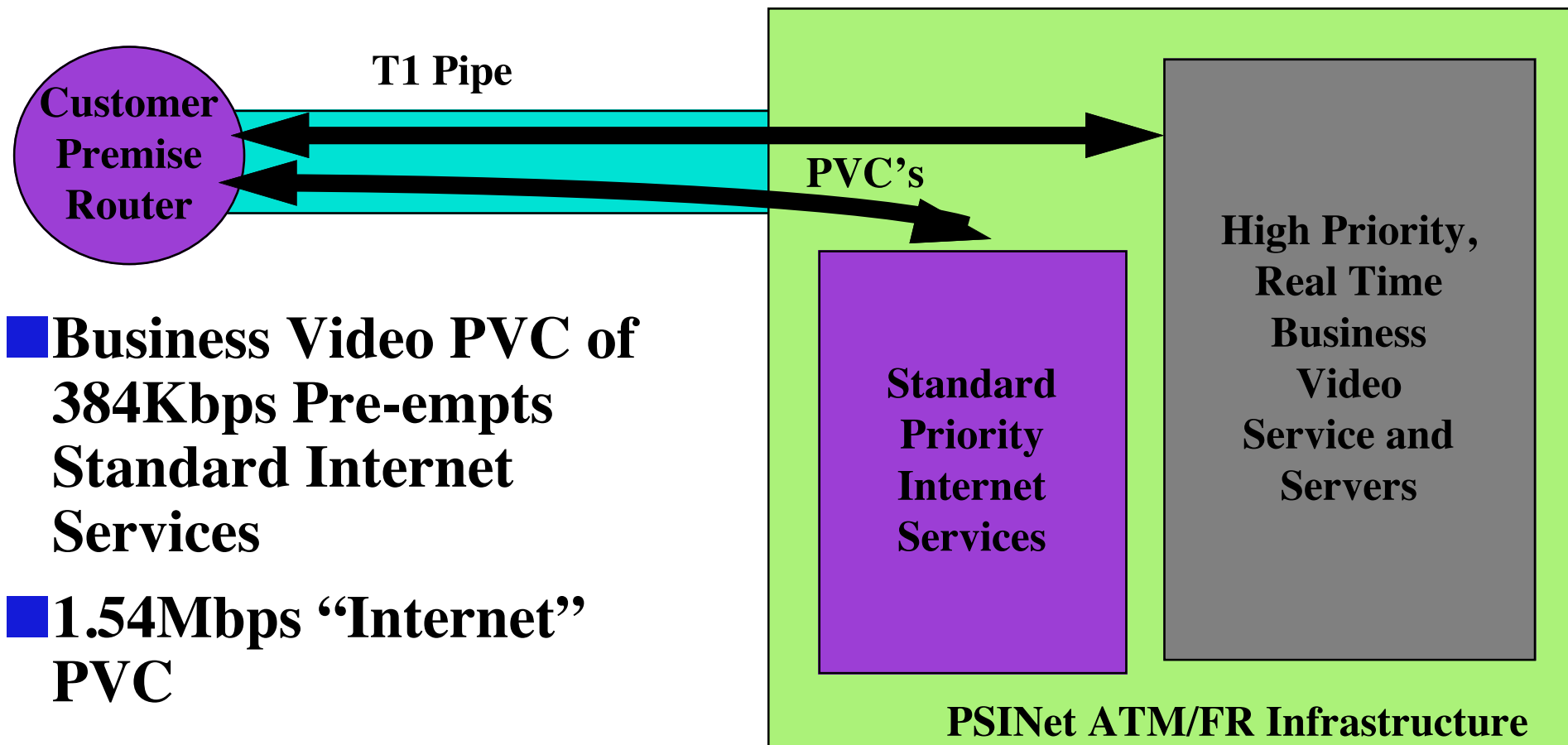


**So we Can Now Provide Different Types of IP Service,
and IP topologies to support them**



The key for lower or higher prioritization: Servers must be inside the network and distributed

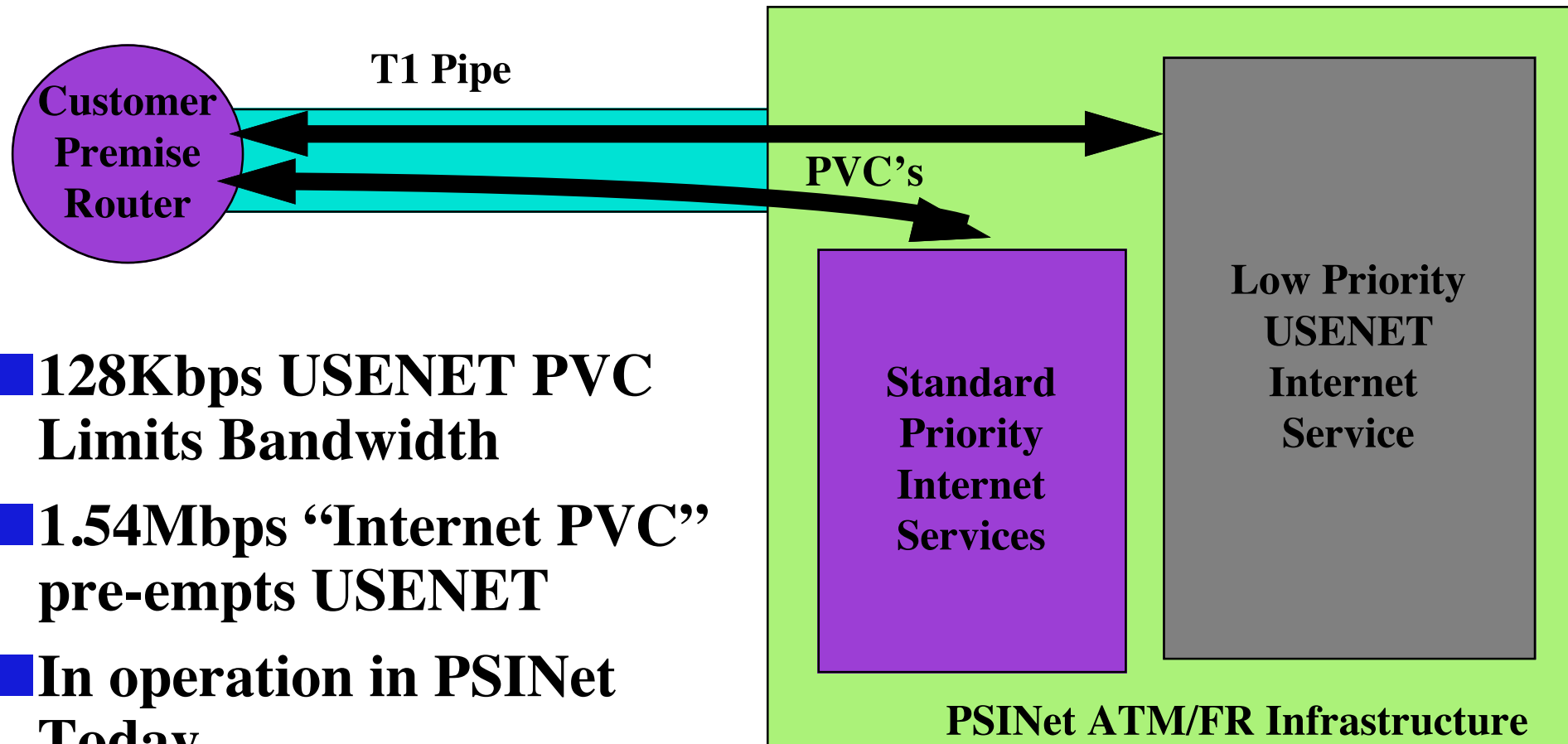
High Priority Application Example: Business Video



■ **Business Video PVC of 384Kbps Pre-empt's Standard Internet Services**

■ **1.54Mbps "Internet" PVC**

Low Priority Application Example: USENET



- **128Kbps USENET PVC Limits Bandwidth**
- **1.54Mbps “Internet PVC” pre-empts USENET**
- **In operation in PSINet Today**



■ **Currently there is quite a bit of informal “entertainment”:**

- MOO’s
- MUD’s
- Bridge
- some uses of CUSEEME and MBONE
- XTREK, etc
- a few LAN Based Consumer Games running over IP
- obviously “surfing the web”
- chat

■ **The Next Phase is Formal Real-Time Entertainment, where many people spend real money**



■ **Gaming on the Internet will be a 1996 Formal Reality**

■ **Driven by Home PC's with Modems (conservatively):**

- June 95: 33M, 10M w/Windows and w/Modems
- June 95: 1/3 of on-line users play games
- 1998: 57M, 32M w/Windows, w/Modems
- 1998: 54% of computers w/Modems have Internet Access

■ **so in 1998**

- if average gamer plays 2 hours/month
- and pays average of \$2/hour
- market size is \$600M/year



- **real-time/low-latency**
- **3D**
- **Titles Found in the Computer stores, not custom network titles**
- **multi-player**
- **real-time distribution of players' voices**
- **where:**
 - at home
 - at work
 - at the Mall

Gaming - The Killer Application



“Entertainment is the 3000 pound gorilla in America’s living room. Information although important to many, takes a back seat. This reality comes through in all of Odyssey’s Research”

**Nicholas Donatiello, Jr.
President & CEO, Odyssey**



- **PSINet is now tuned to real-time multi-media, multi-player interactive gaming**
- **Server's are now in place for Gaming partner's to use**
- **Guaranteed low latency is a reality**
- **technology for gaming is usable for other business purposes**



- **Superior Internet Technology is needed to provide Real Time Internets for business and entertainment.**
- **Demand for Internet entertainment is on the rise and will materialize in 1996 in the form of interactive multi-player gaming.**
- **All Internet uses benefit from superior technology and experience.**
- **PSINet is uniquely engineered and positioned to provide real time Internet services today.**



- **Strategic Partnership with MPATH Interactive and its network publishing platform for games and its title partners**
- **Partnership with Microprose for the Civilization game**
- **Strategic Partnership with Borta Inc. for its games and technology**
- **Partnership with Vocaltec for its “Internet Phone” software for Windows**



■ **Phone: 1-703-904-4100**

■ **Email: info@psi.com**

■ **Web: http://www.psi.net**

■ **Nasdaq: PSIX**

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How SGML and HTML Really Fit Together

Eric Severson
Interleaf, Inc.
President, SGML Open

My First Shortwave Radio



Interleaf

Suddenly Connected!



Interleaf

A World of Business



Interleaf

Why Are People Interested?

- **Killer Infrastructure**
- **Killer App (Mosaic)**

... Keith Dawson in *The Gilbane Report*

Interleaf

Why Are People Interested?

- **Killer Infrastructure**
- **Killer App (Mosaic)**
- **Killer Content**

... Keith Dawson in *The Gilbane Report*

Interleaf

Why Are People Interested?

- Killer Infrastructure
- Killer App (Mosaic)
- Killer  Content

... Keith Dawson in *The Gilbane Report*

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What We Have Now

- **Company “storefronts” / some advertising**
- **Internal memos / reports**
- **“Lightweight” academic material**
- **Experimentation with commercial transactions**
- **Several optometrists**

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What's In Demand

- **More serious in-house and external corporate publishing**
- **Internal corporate information access / distribution**
- **Material for serious academic and business research**
- **Book / magazine publishers**

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Business Is A Big Part of The Vision

“With the hyperlink kind of paradigm that you see on the Web, you can imagine putting all of your corporate documentation on there ... even design files for machines.”

Bill Joy of Sun Microsystems
Information Week, July 17, 1995

Interleaf

What's The Attraction?

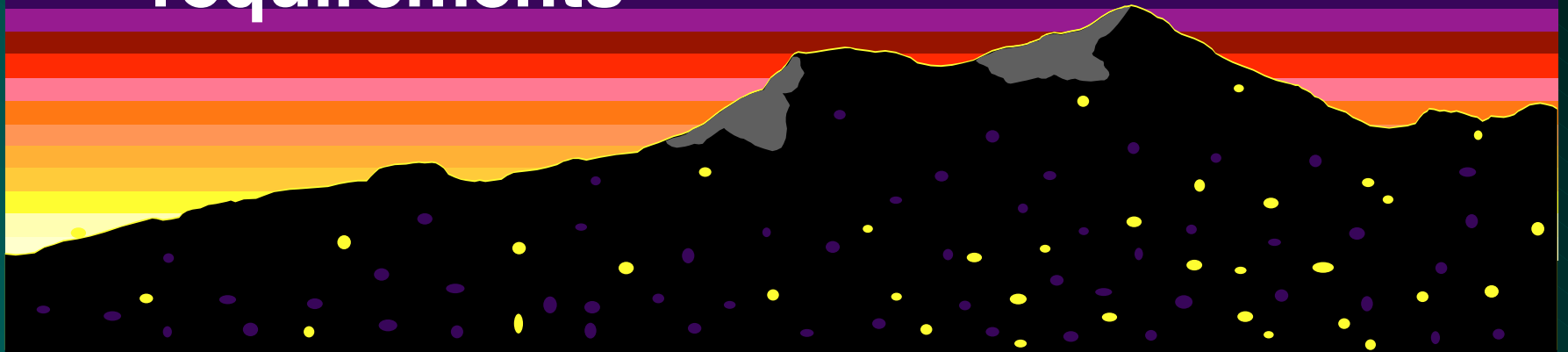
- **Online distribution of simple information**
- **Reasonably nice format**
- **Ability to browse with hyperlinking between documents**
- **Open access to all Web users and all Web software**

What Needs Can Be Anticipated?

- **Central repository to drive multiple output formats and support collaborative authoring / editing**
- **Data format capable of protecting investment in complex, long-lived data**
- **Data reuse**
- **Linkages to other databases and business systems**

My Observations

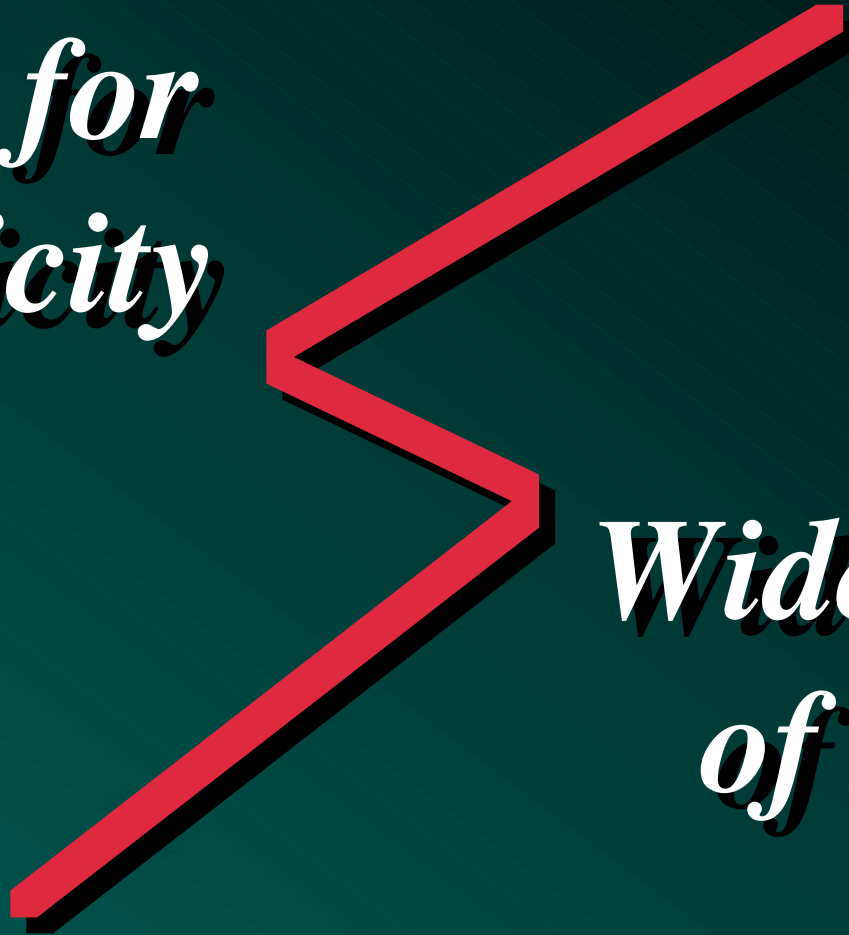
- Wild enthusiasm for the Web
- Desire for simplicity
- In reality, a wide range of needs / requirements



Interleaf

Potentially Huge Trade-off

*Desire for
Simplicity*



*Wide Range
of Needs*

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Common Questions

“What’s the difference between SGML and HTML?”

“If you have HTML, is there any need for SGML?”

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A Closer Look at SGML

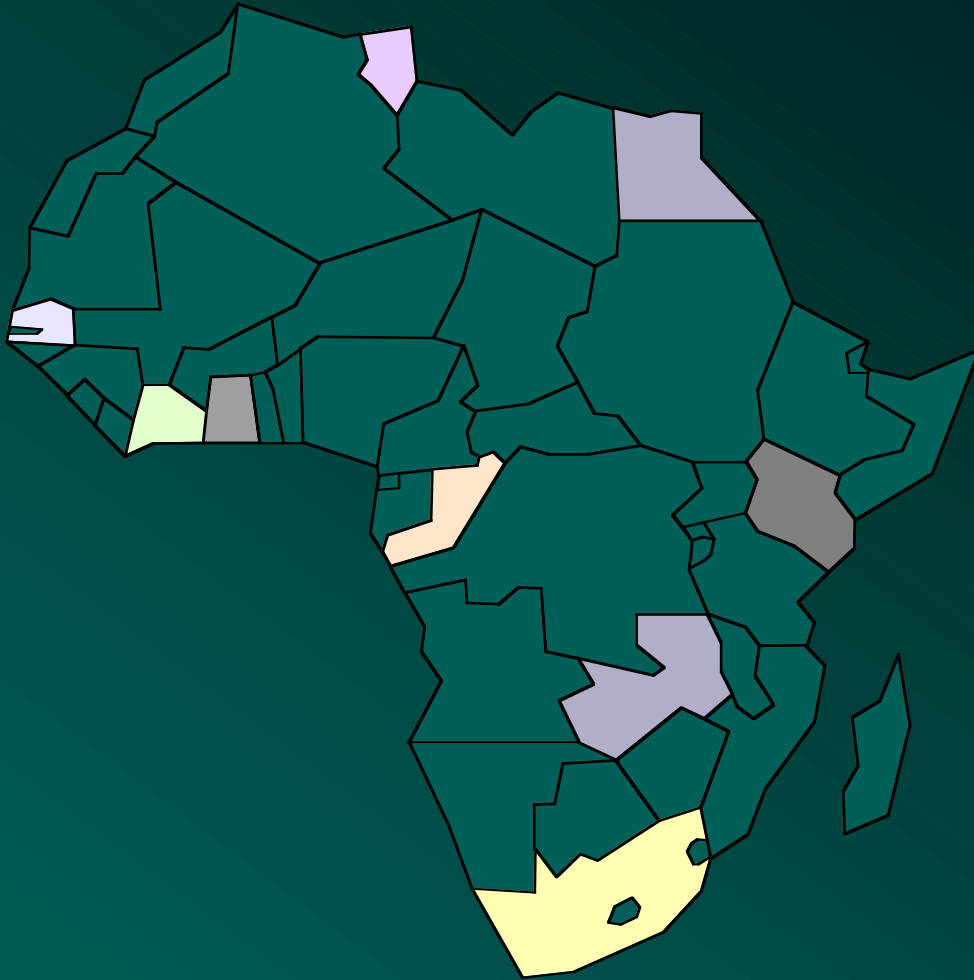
- ISO standard since 1986
- Focus on structure and content, no proprietary formatting codes
- Open interchange / platform independence
- The standard chosen for HTML

Exploring SGML ...



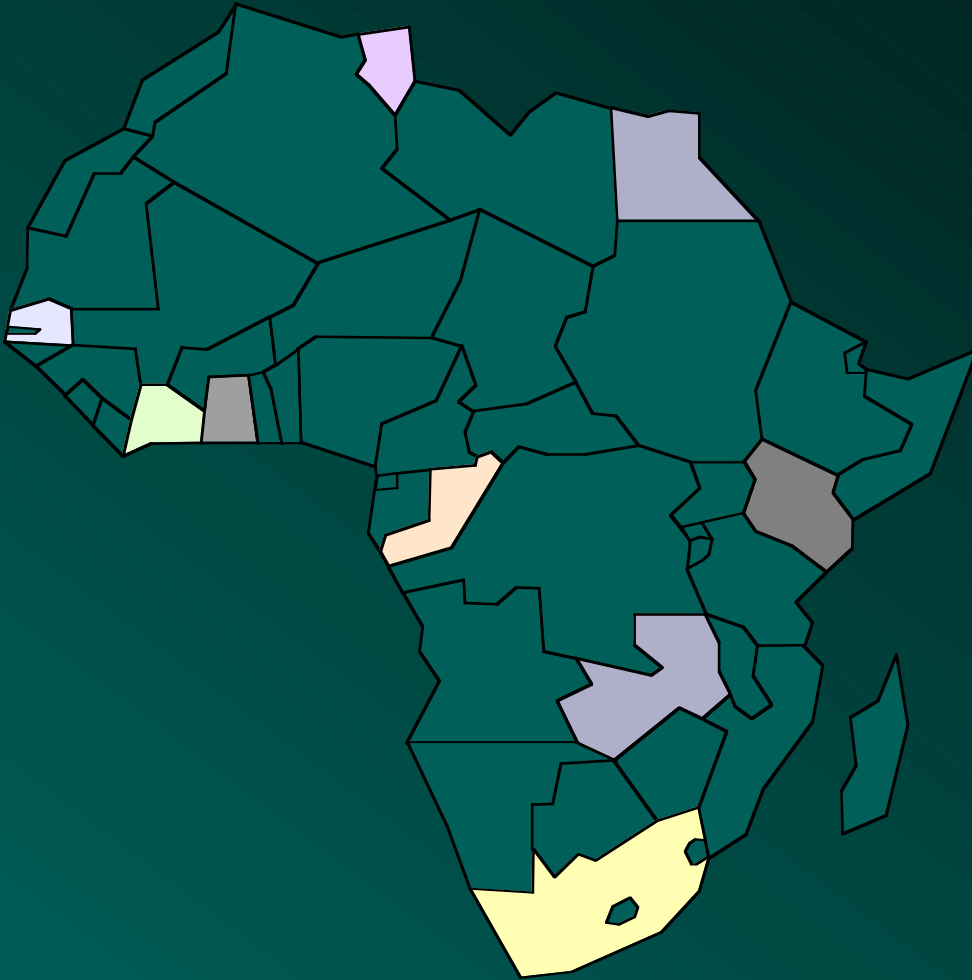
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Exploring SGML ...



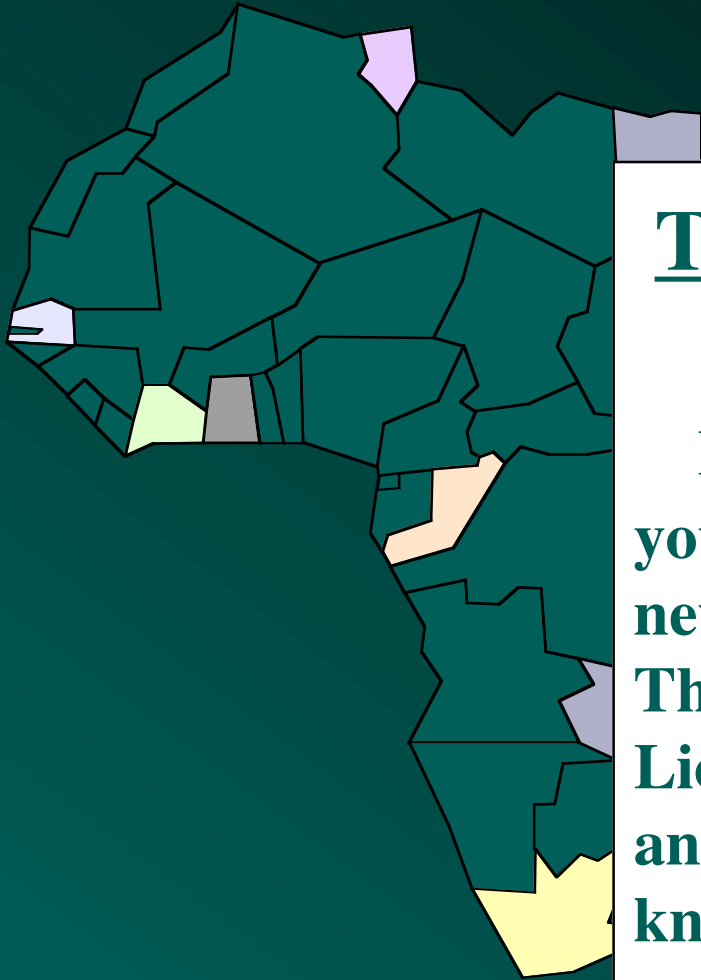
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Exploring SGML ...



Interleaf

Exploring SGML ...



The Lion King

If you like *Africa*, you'll love Disney's new animated feature, **The Lion King**. The **Lion King** uses a new animation process known to the industry



Interleaf

Proprietary Format Codes

The Lion King

If you like *Africa*,
you'll love Disney's

new and
The Li
Lion K
animat
known

[CENTER] [BOLD] [UNDERLINE]

The Lion King

[SPACE 1]

[INDENT] If you like [ITALIC] Africa
[PLAIN], you'll love Disney's new

Interleaf

Generic SGML Tags

The Lion King

If you like *Africa*,
you'll love

new a

The L

Lion K

anima

know

[CENTER] [BOLD] [UNDERLINE]

<CHAPTER>

<TITLE> The Lion King </TITLE>

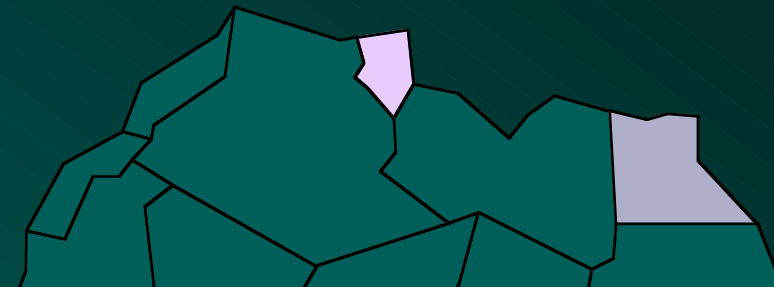
<PARA> If you like <LINK>Africa</LINK>,
you'll love Disney's new animated feature

Interleaf


Multiple Formats



Search Using Inner Structure



*“Find the word
‘Lion’ only if it
occurs in a
chapter title”*



SGML



Interleaf

Flexible Reuse



TODAY'S MOVIES

August 7, 1995

The Lion King

1:00 PM

If you like Africa,
you'll love Disney's
new animated

Interleaf

SGML Is About Objects...



Chapter

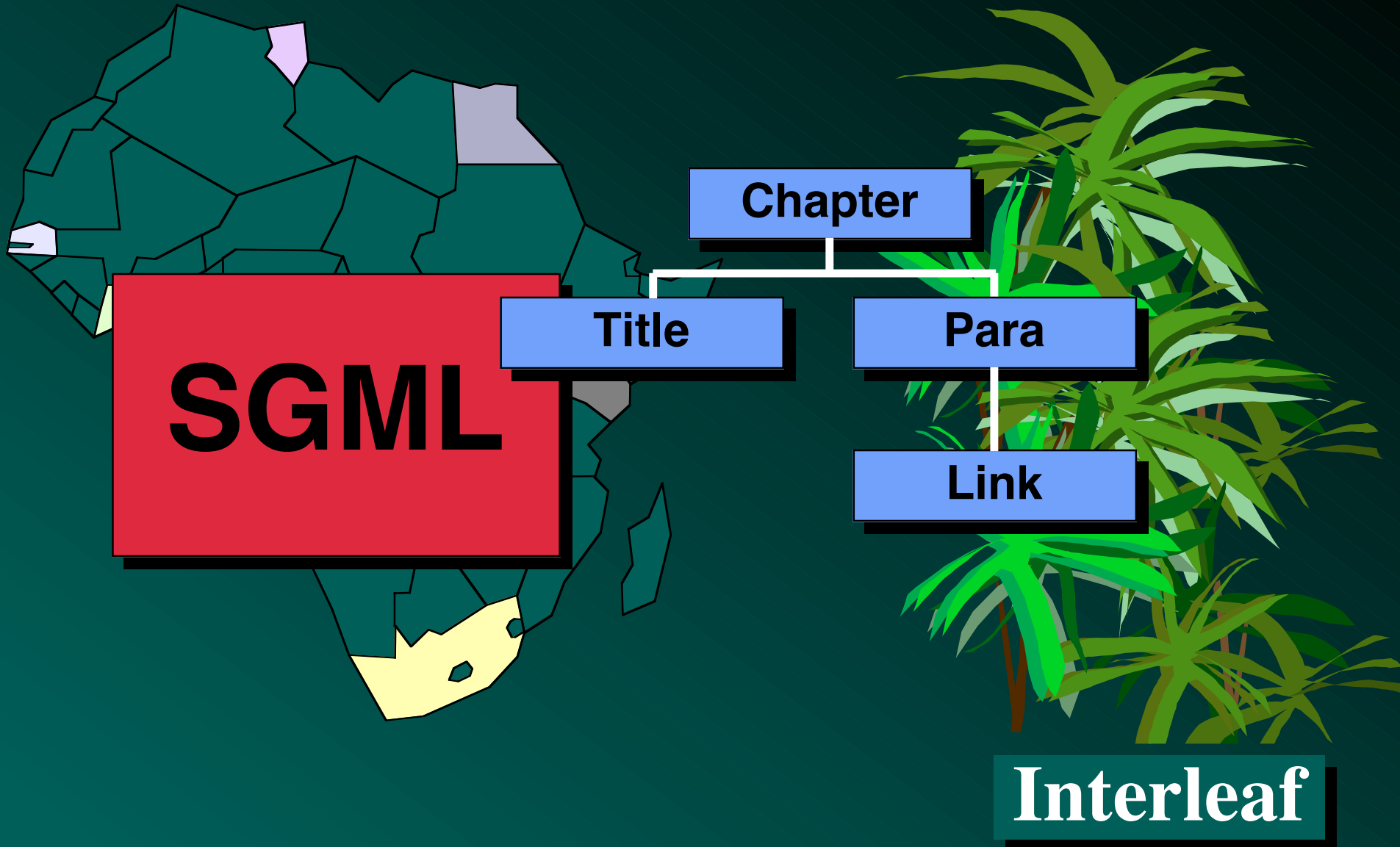
Title

Para

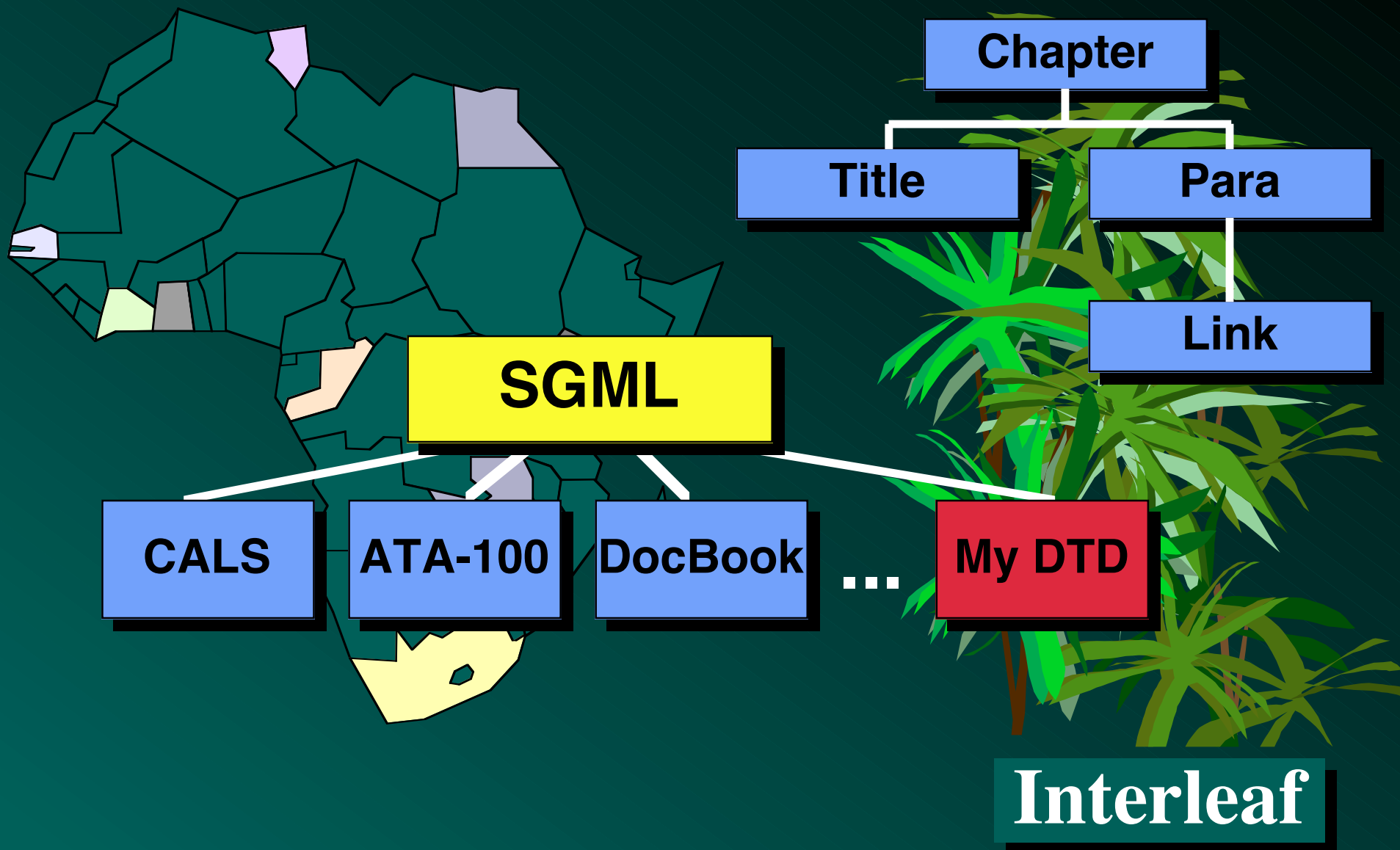
Link

Interleaf

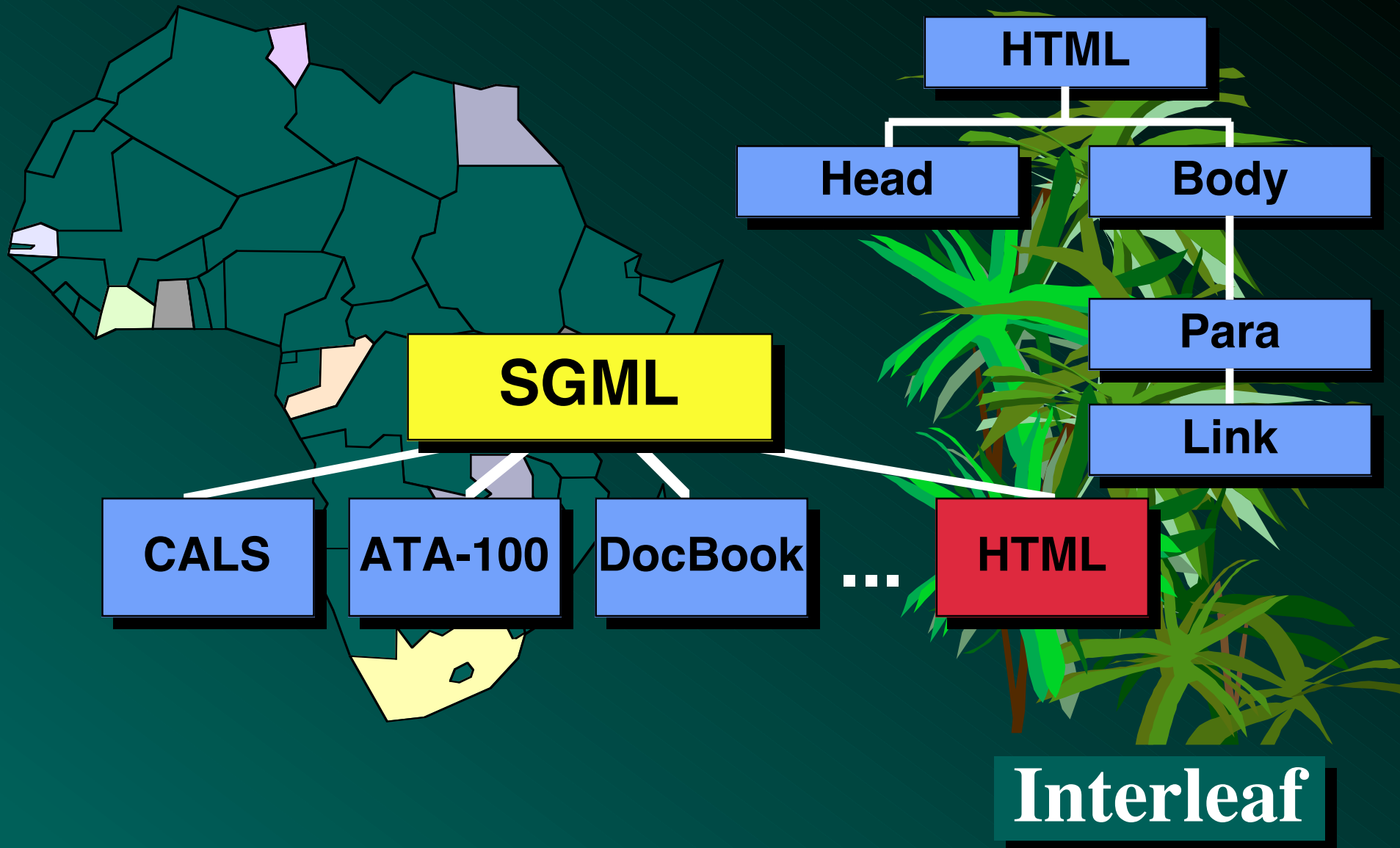
In a Defined Structure (DTD)



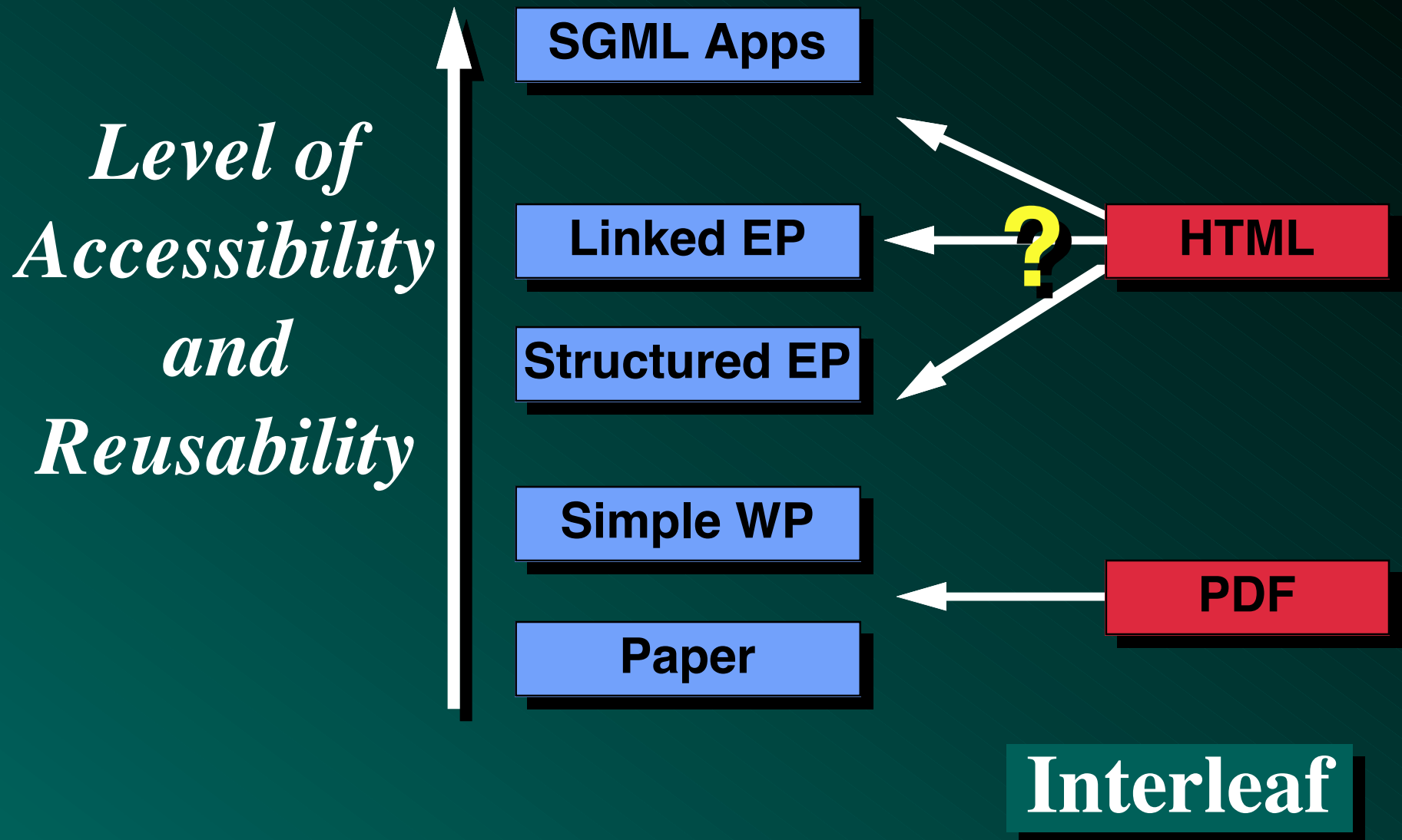
Each DTD Is An “Application”



... Including HTML



HTML In The Food Chain



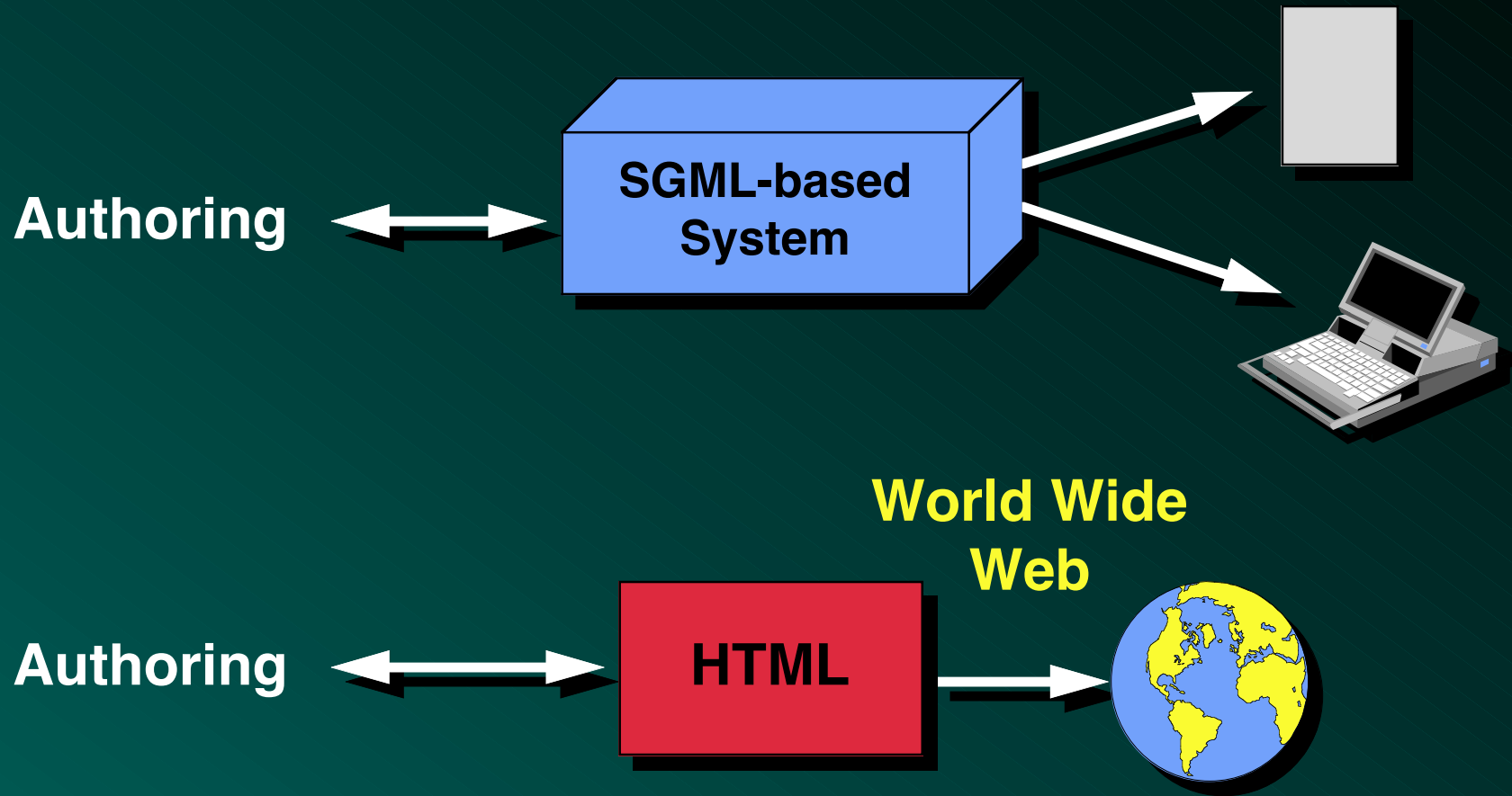
More Questions ...

“Is HTML a general interchange format?”

“Could HTML be the form in which I store my documents?”

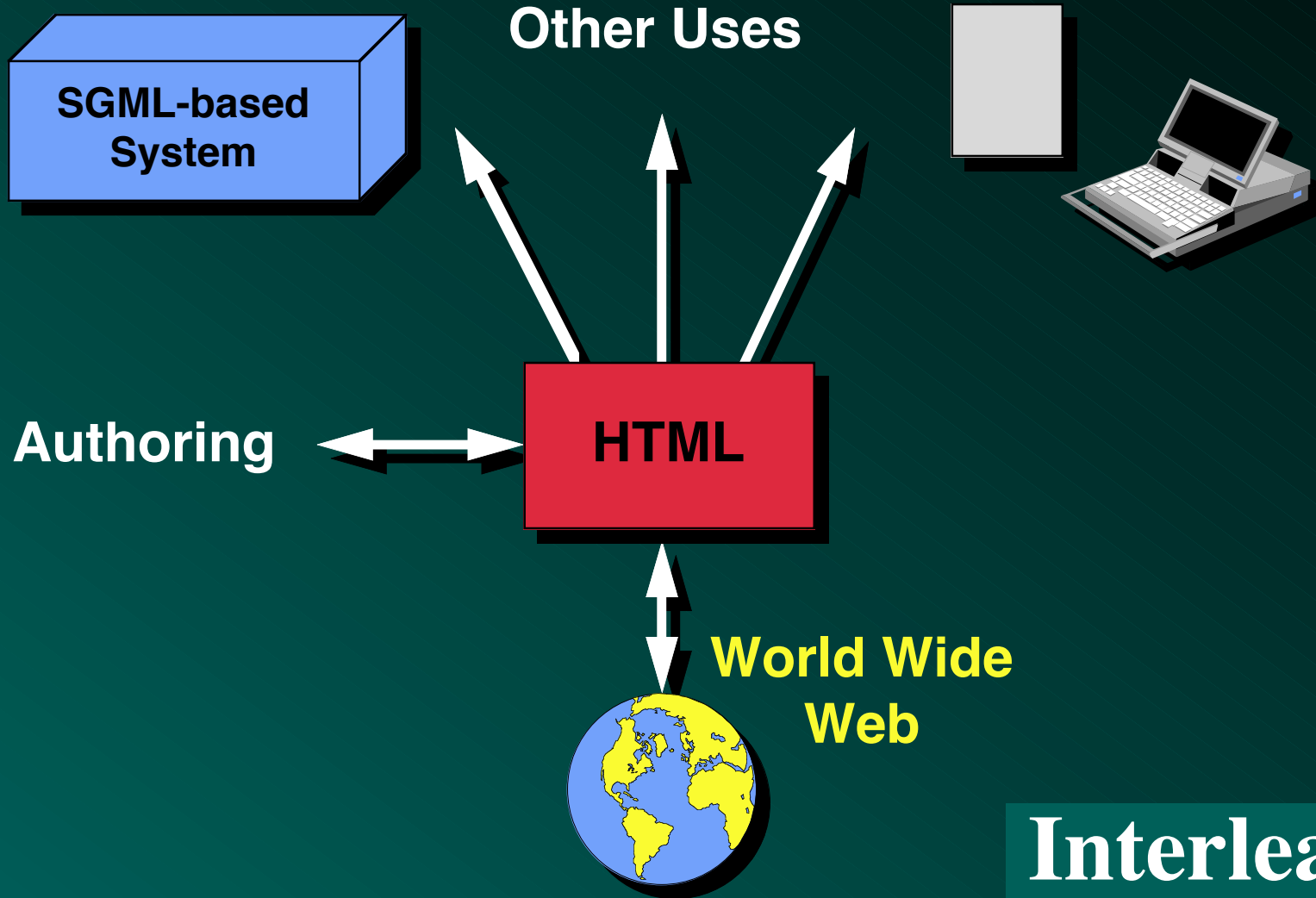
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How To Put Them Together?

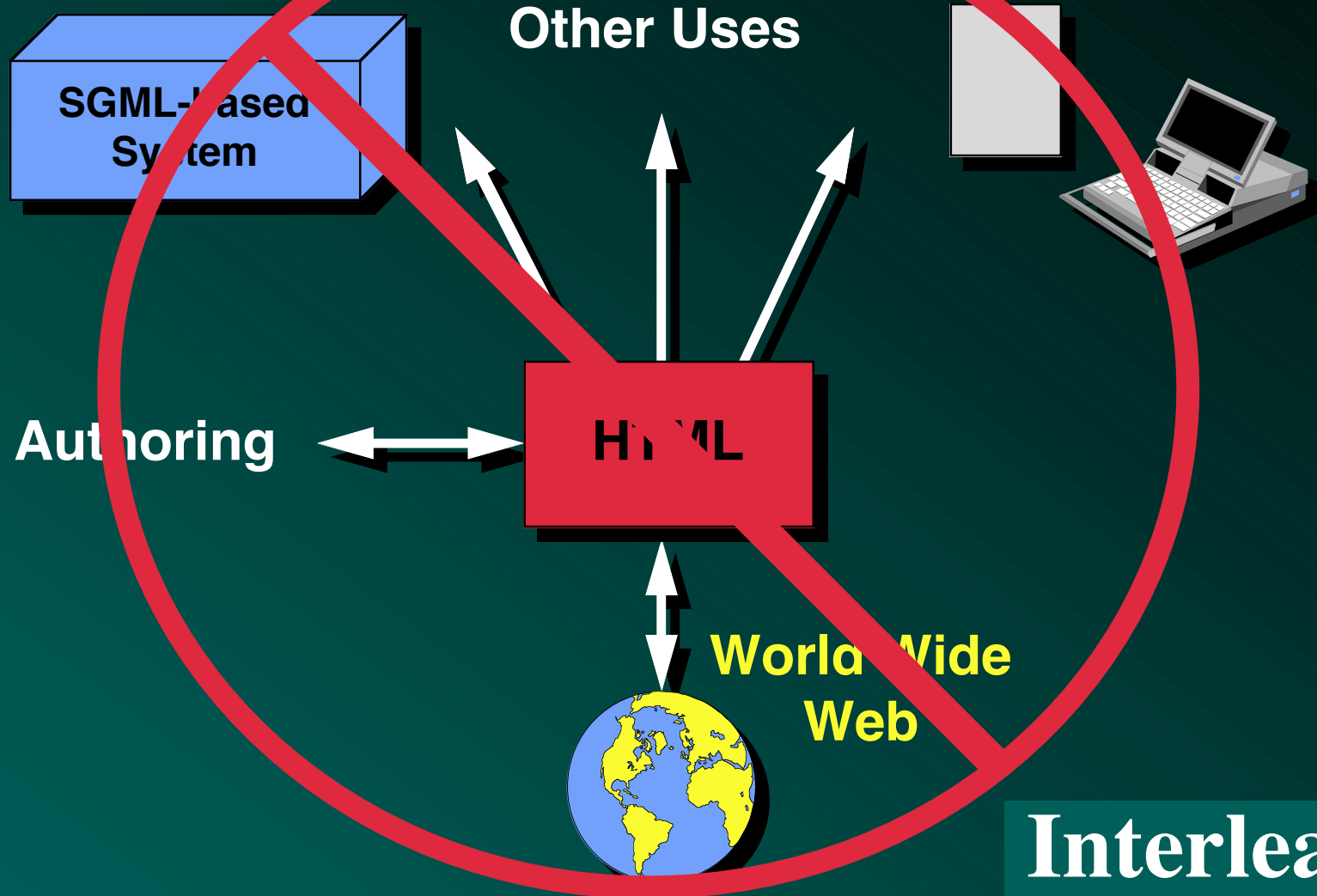


Interleaf

HTML In The Center?



HTML In The Center?



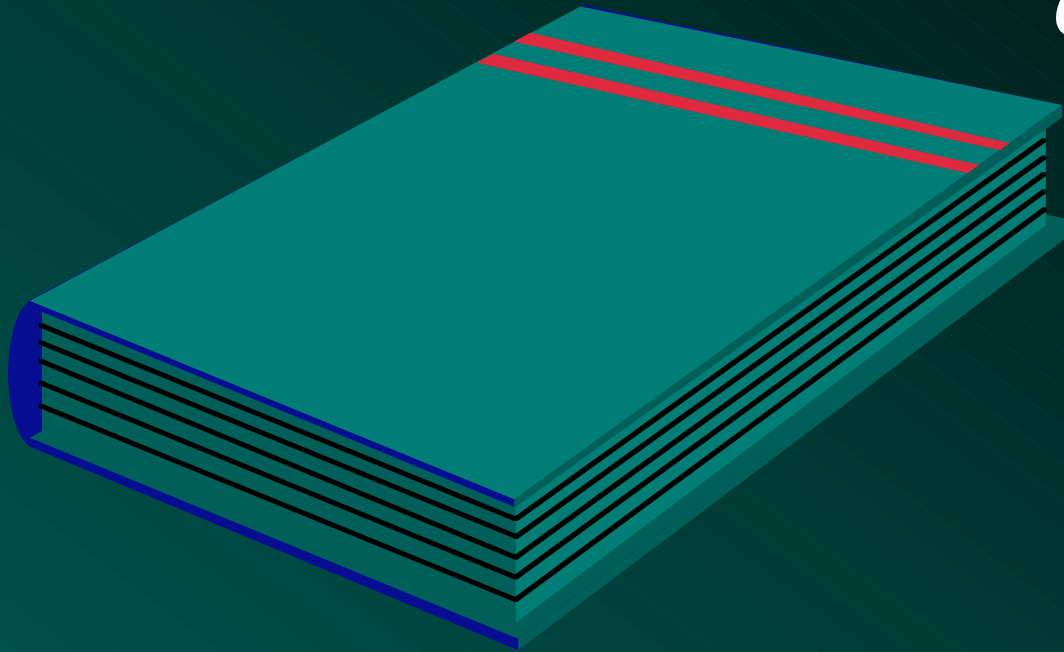
Interleaf

Why Not?

- **Because HTML is a lowest common denominator, “one size fits all” solution**
- **Because HTML itself is rapidly evolving**
- **To avoid the up-translation problem**

The Up-Translation Problem

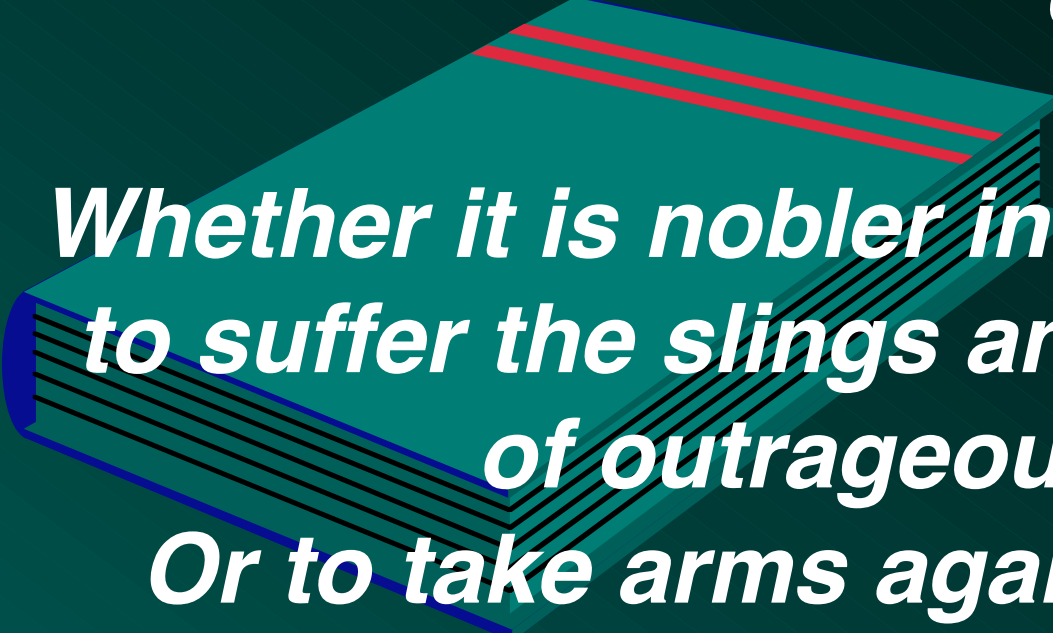
“To be or not to be, that is the question:



Interleaf

The Up-Translation Problem

“To be or not to be, that is the question:



*Whether it is nobler in the mind
to suffer the slings and arrows
of outrageous fortune
Or to take arms against a sea
of troubles and by opposing...”*

Interleaf

The Up-Translation Problem

Simpler Form:

Interleaf

The Up-Translation Problem

Simpler Form:

“Is this jive worth it?”

Interleaf

The Up-Translation Problem



“Is this jive worth it?”

Interleaf

The Up-Translation Problem



“Is this jive worth it?”

Interleaf

The Up-Translation Problem

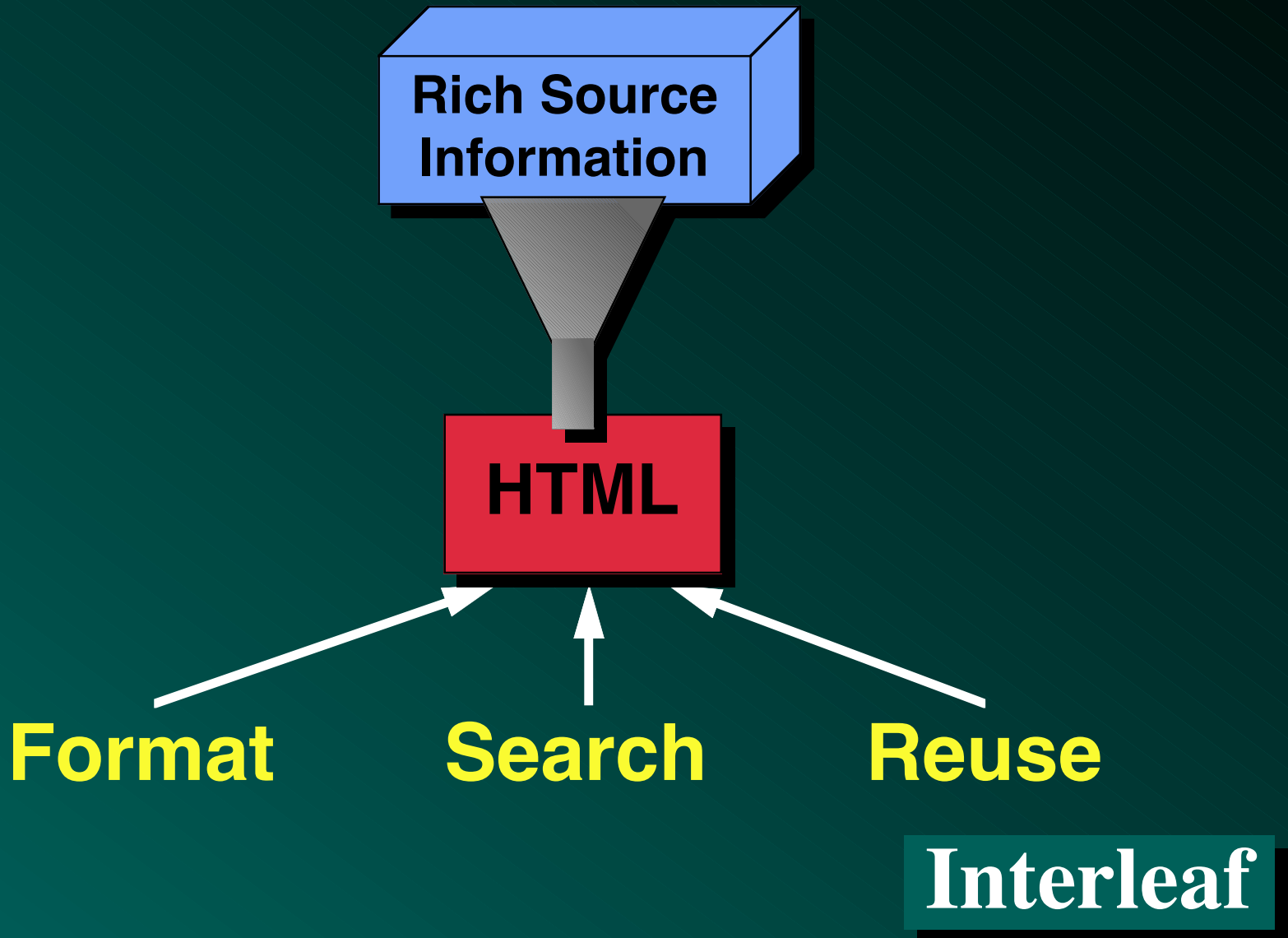
*“To be or not to be, that is the question:
Whether it is nobler in the mind
to suffer the slings and arrows...”*



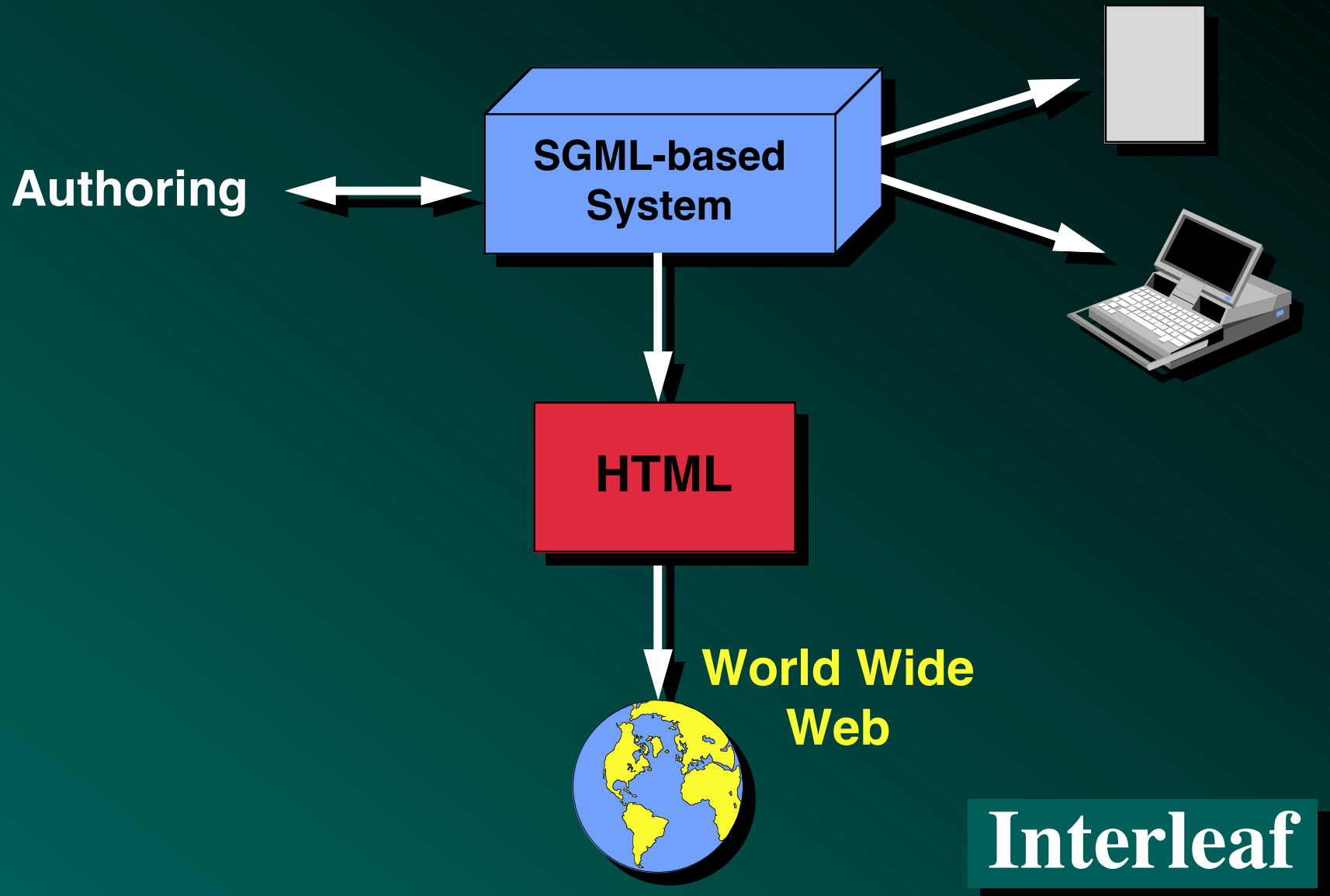
“Is this jive worth it?”

Interleaf

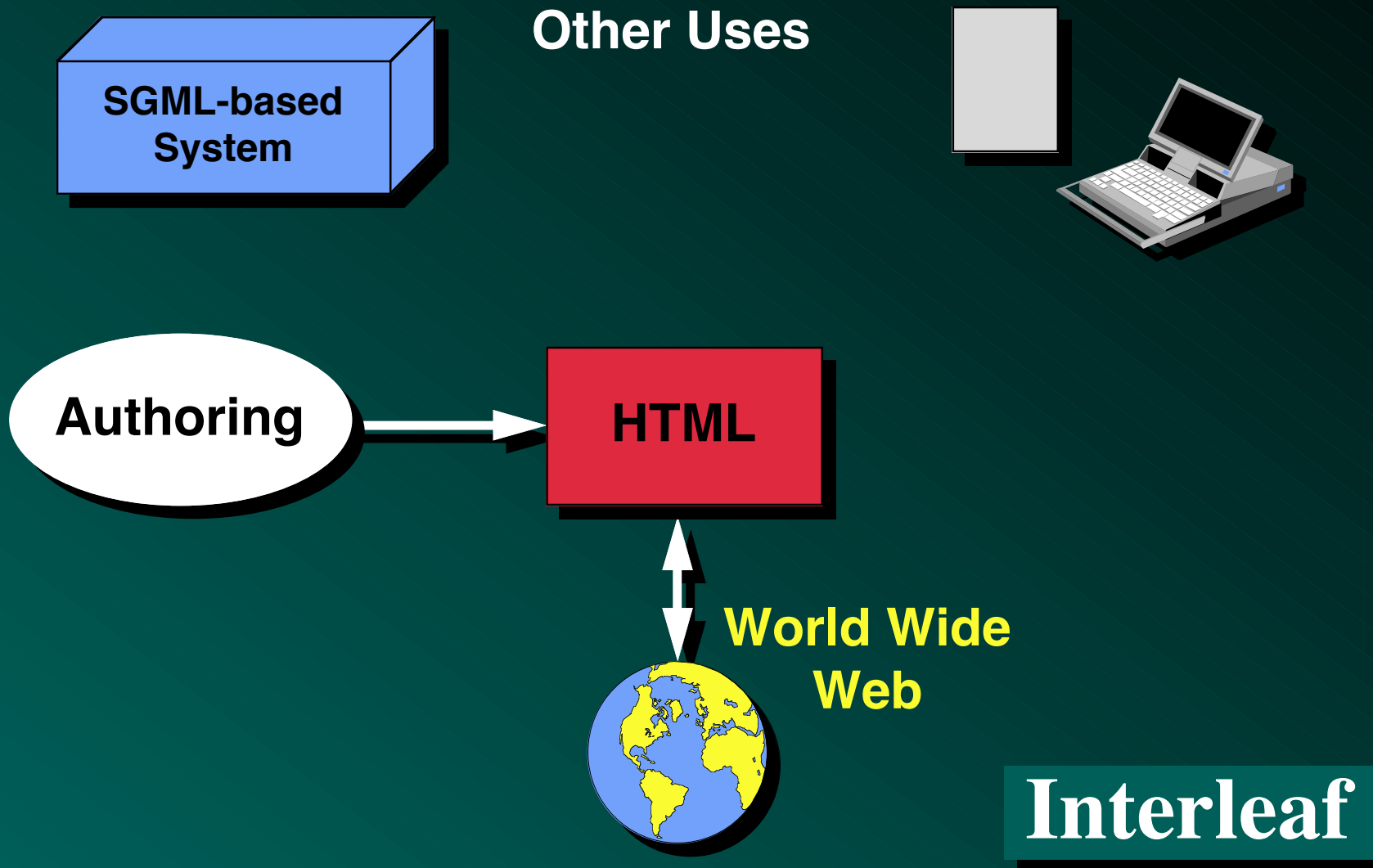
HTML Has The Same Issue



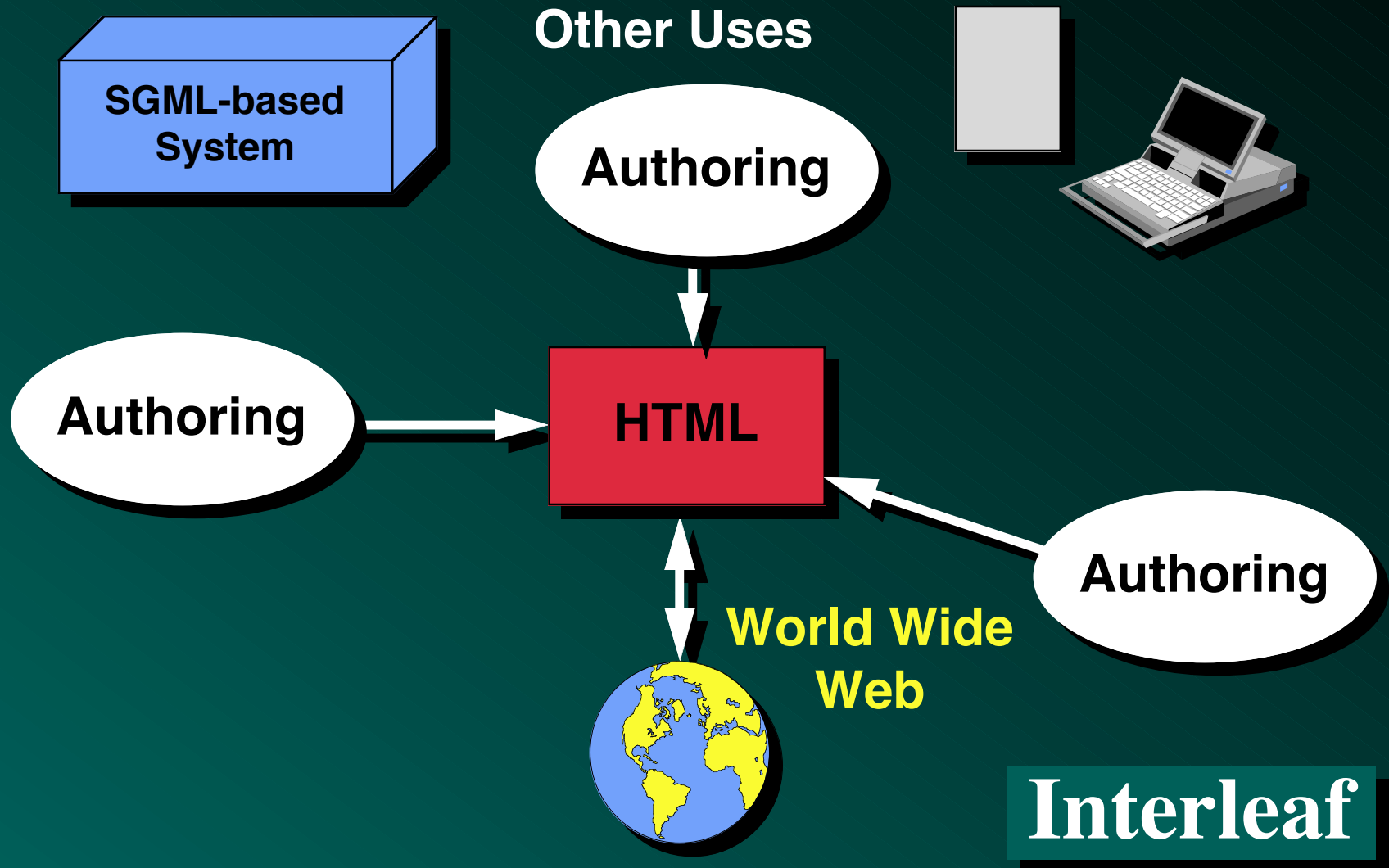
HTML As A Publishing Medium



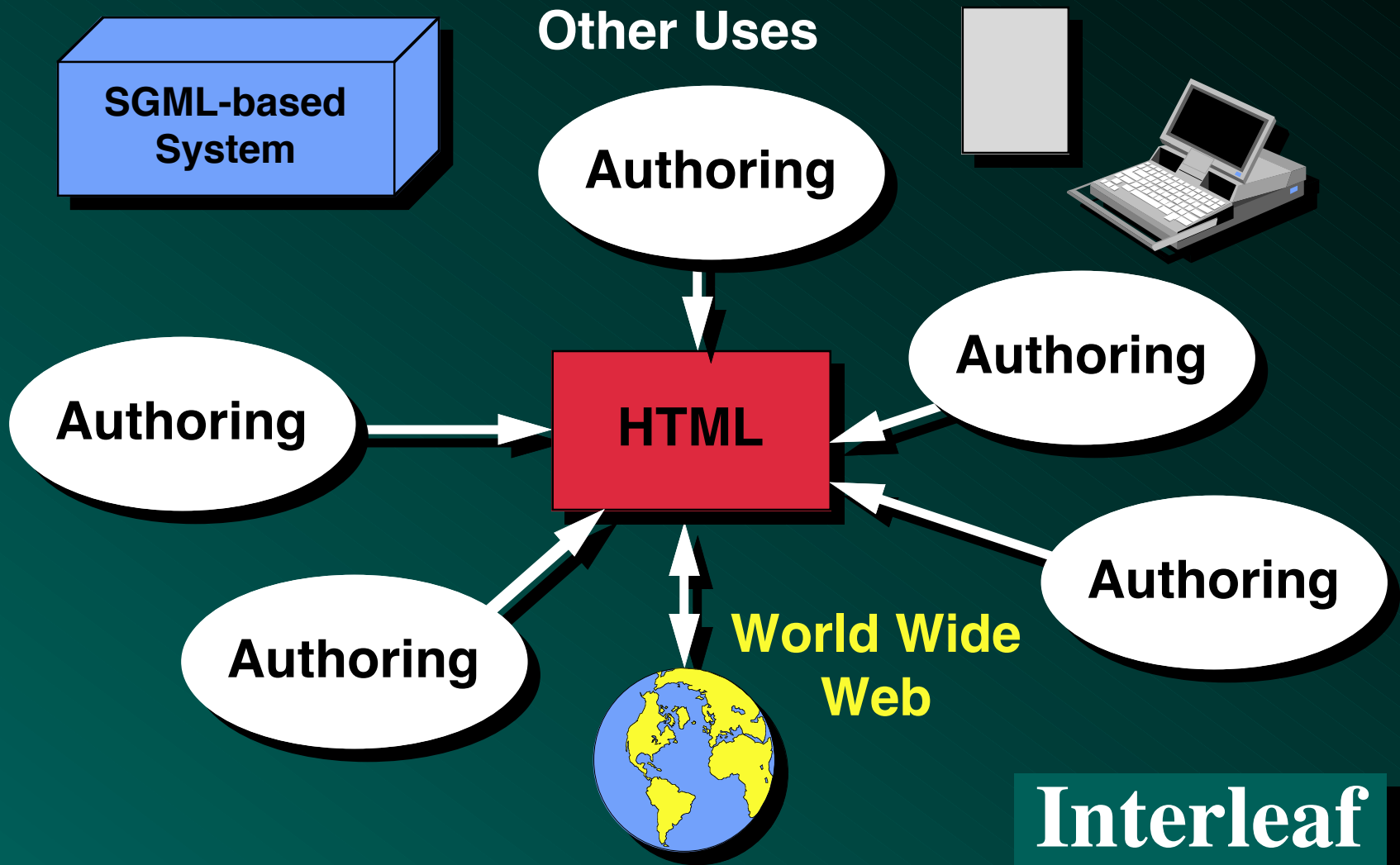
HTML In The Center?



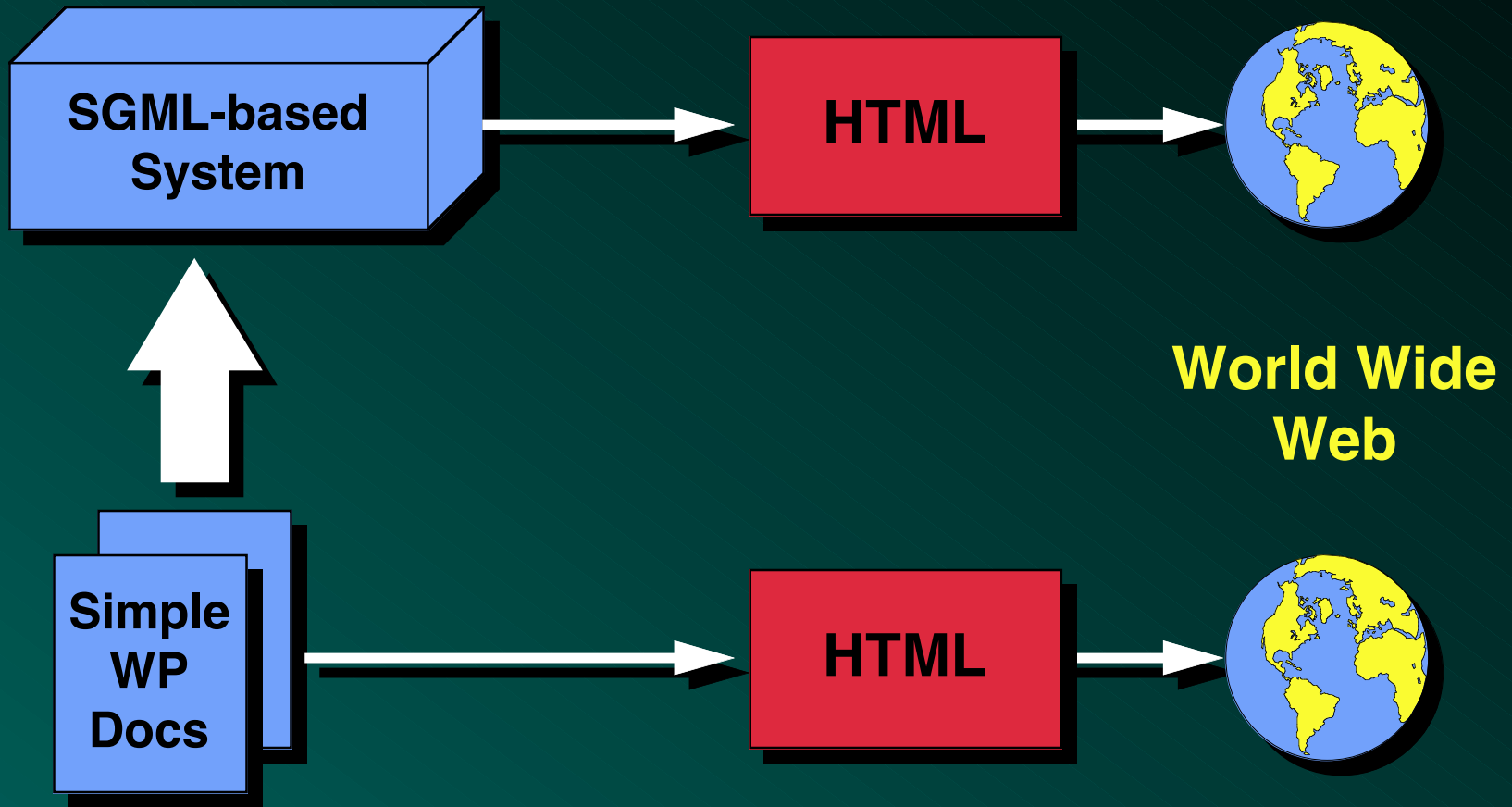
HTML In The Center?



HTML In The Center?



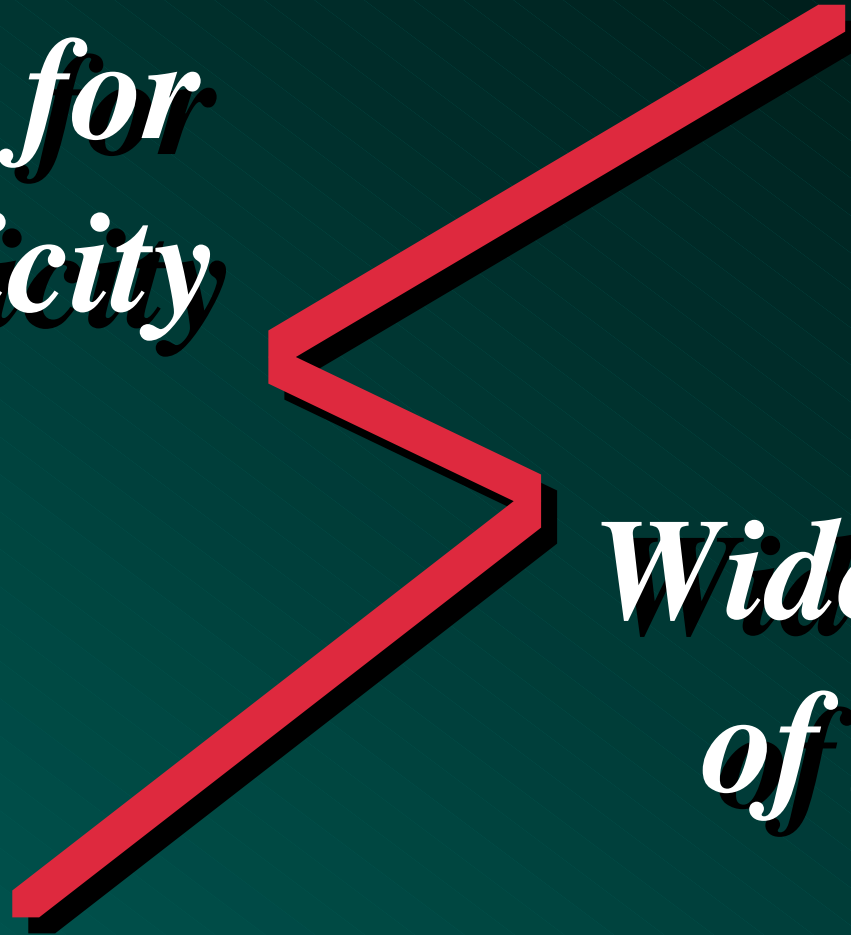
Same Principle At Any Scale



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Different Approaches ...

*Desire for
Simplicity*



*Wide Range
of Needs*

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HTML Addresses Simplicity

- **Simple and forgiving**
- **Focus on connectivity**
- **Standard, predefined set of Web objects**

SGML Addresses The Wide Range

- **Powerful information access and reuse**
- **Focus on structure and content, plus linking**
- **Flexible, application-specific objects**

Interleaf

What's Wrong With Simplicity?



Interleaf

Many Objects vs. One Object

SGML

Abstract

Intro

Preface

Note

Summary

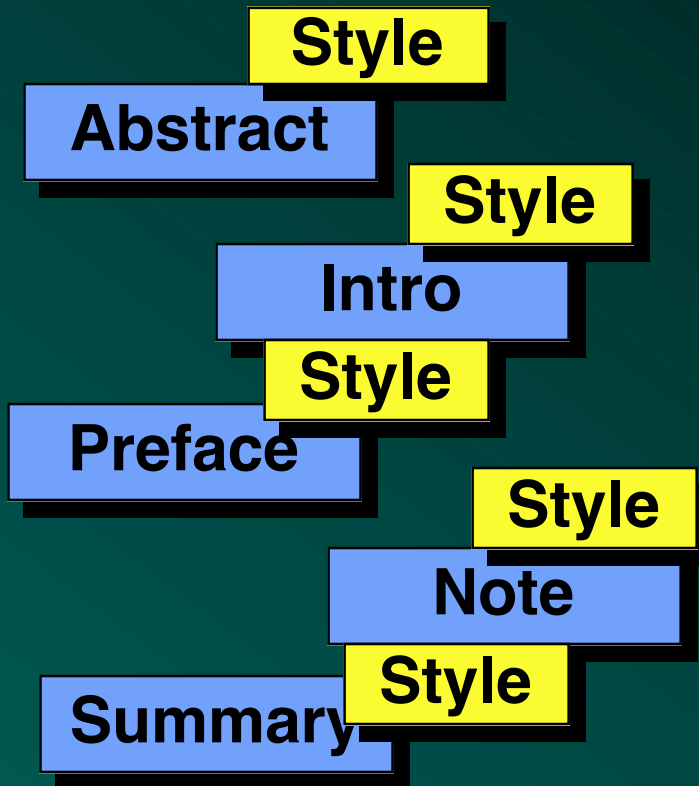
HTML

Paragraph

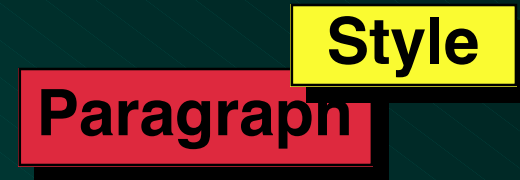
Interleaf

Many Formats vs. One Format

SGML



HTML



Interleaf

Same for Search and Reuse

SGML

Title

Abstract

Intro

Preface

Note

Summary

HTML

Title

Paragraph

Paragraph

Paragraph

Paragraph

Paragraph

Interleaf

Web as Information Explosion

- **First, linear search**
- **Then, binary search...**
- **Now, “housefly” search**

Web as Information Explosion

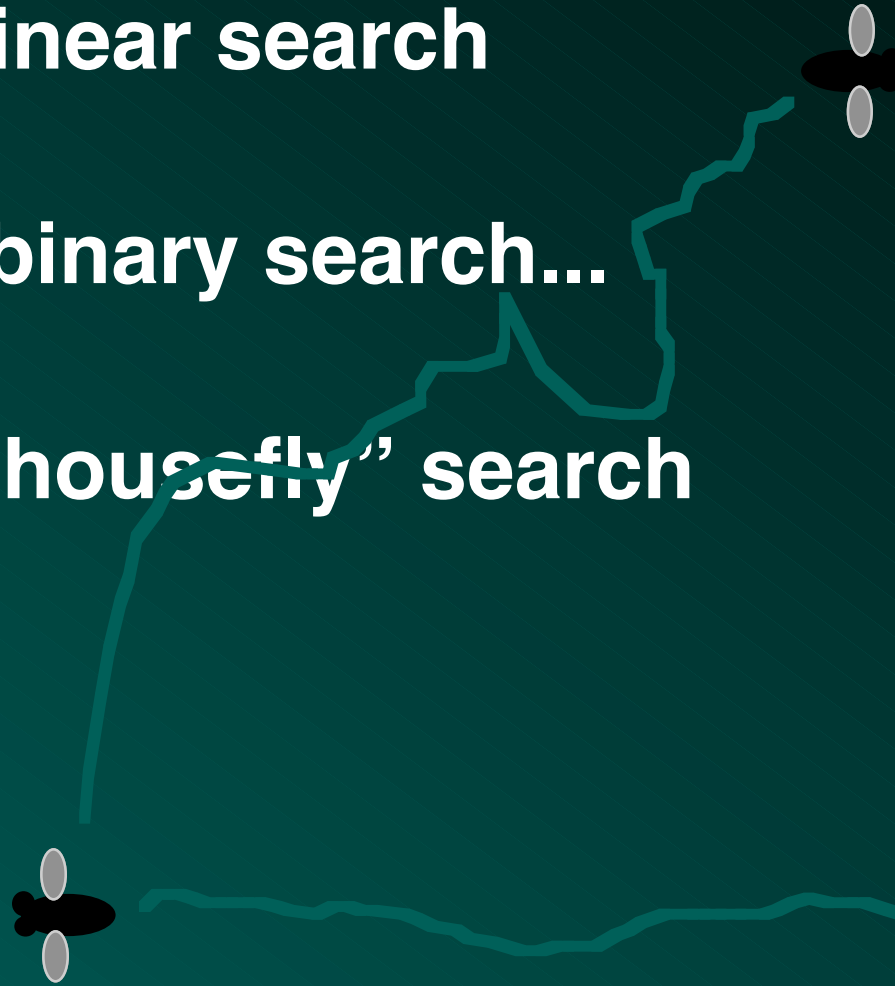
- First, linear search
- Then, binary search...
- Now, “housefly” search



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Web as Information Explosion

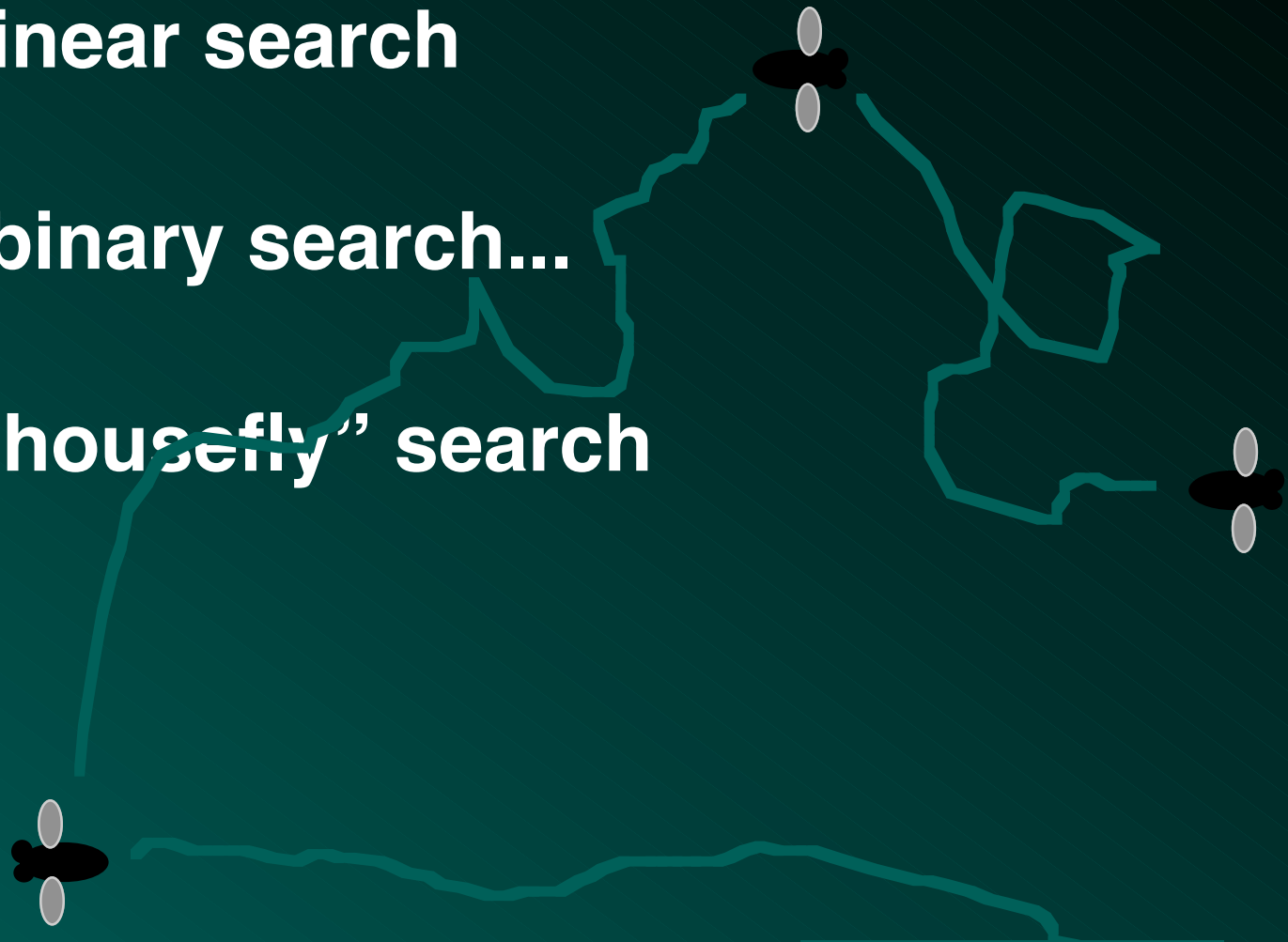
- First, linear search
- Then, binary search...
- Now, “housefly” search



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Web as Information Explosion

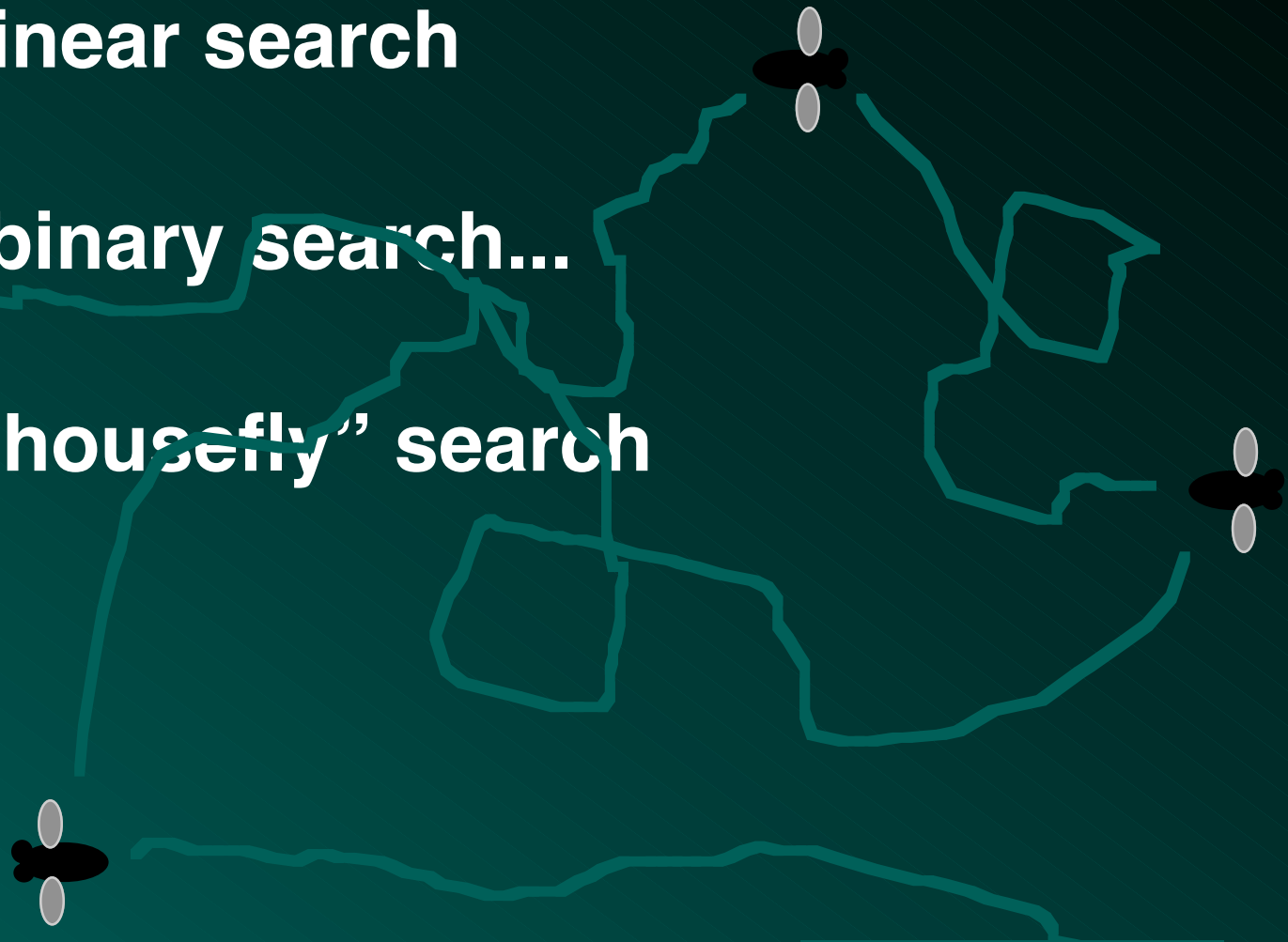
- First, linear search
- Then, binary search...
- Now, “housefly” search



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Web as Information Explosion

- First, linear search
- Then, binary search...
- Now, “housefly” search



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Why Not Just Use SGML?

- **A lot of upfront investment to build applications**
- **No standard backbone structure**

SGML Is Application-Specific

*My
Application*

CHAPTER

XREF

*Your
Application*

H1

A

*Another
Application*

JOE

SCHMOE

No Shared Semantics



Interleaf

The Semantics Are In Your Head

*My
Application*

Heading =
CHAPTER

Link =
XREF

*Your
Application*

Heading =
H1

Link =
A

*Another
Application*

Heading =
JOE

Link =
SCHMOE

Interleaf

The Dilemma

Simple

Powerful

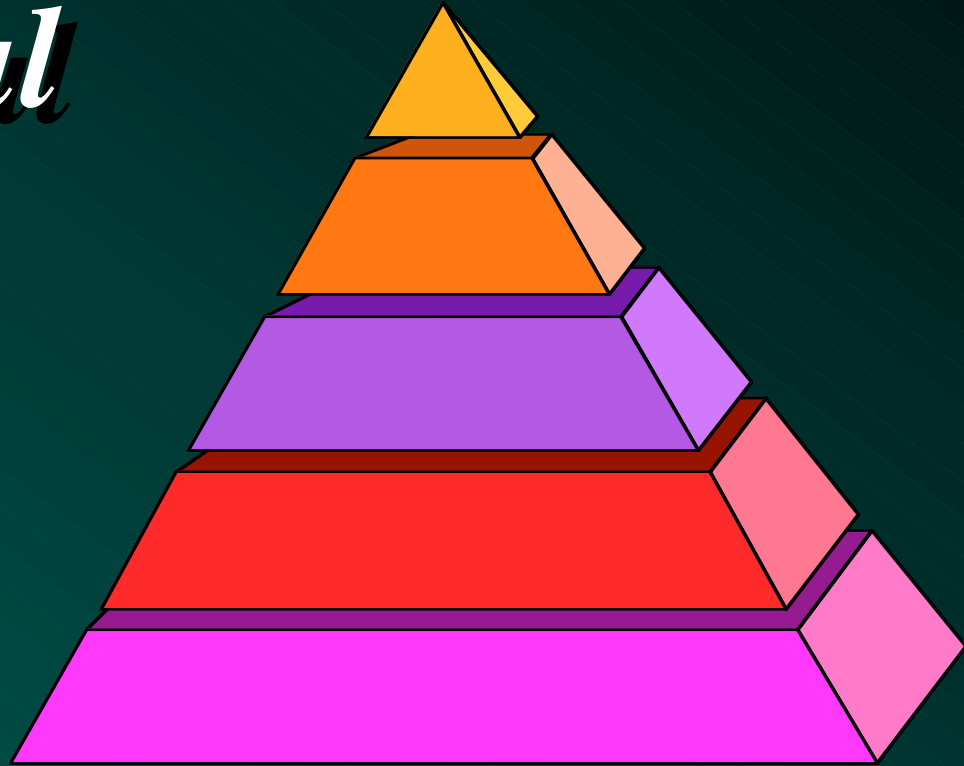
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A Solution: Make It Scalable!

Powerful



Simple



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An Acid Test for Scalability

- **“Hello World” with only 2-3 tags**
- **Corporate annual report with sophisticated viewing / search / reuse**
- **Something reasonable with even the simplest HTML browser**

Scalability in TV



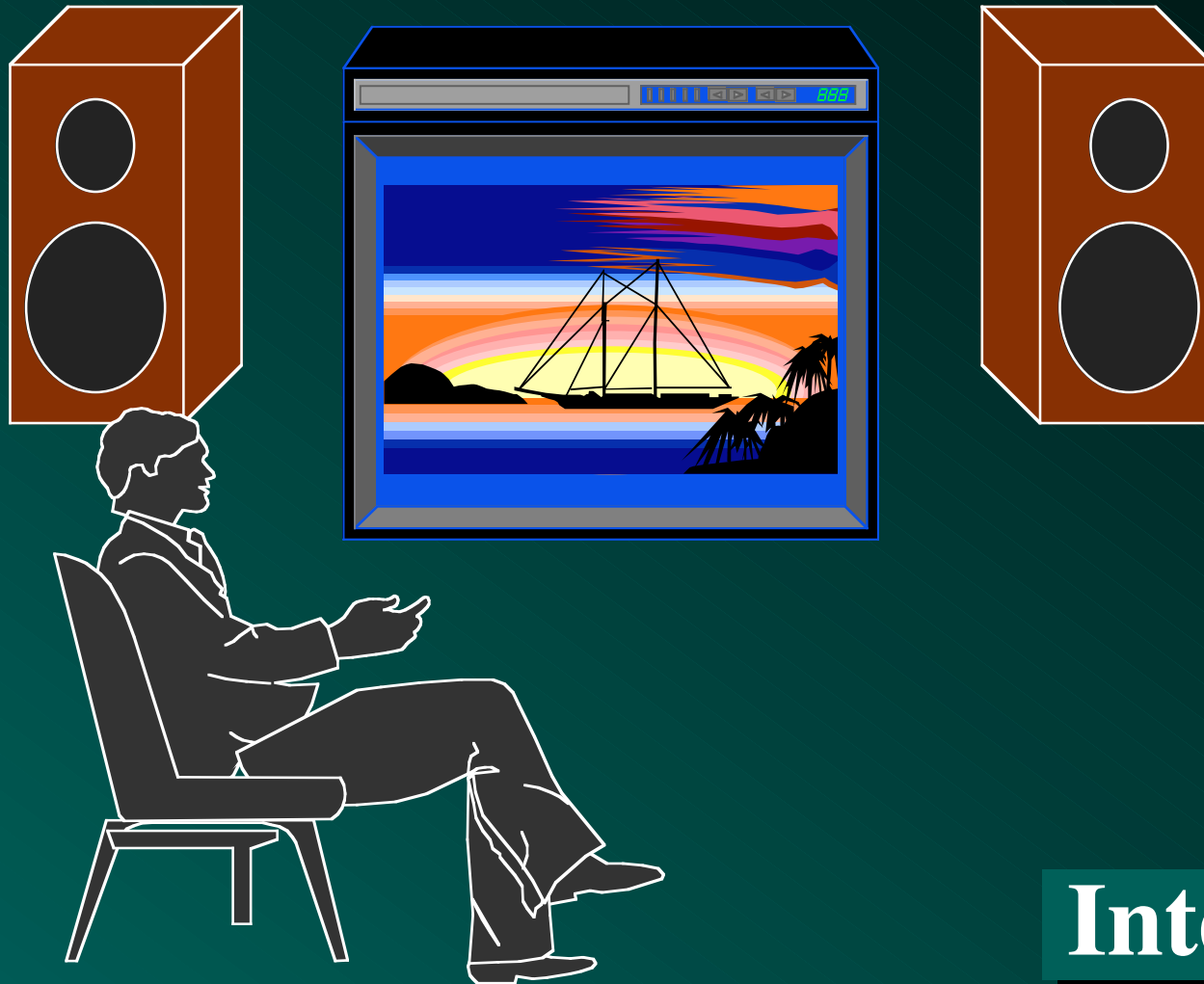
Interleaf

Scalability in TV



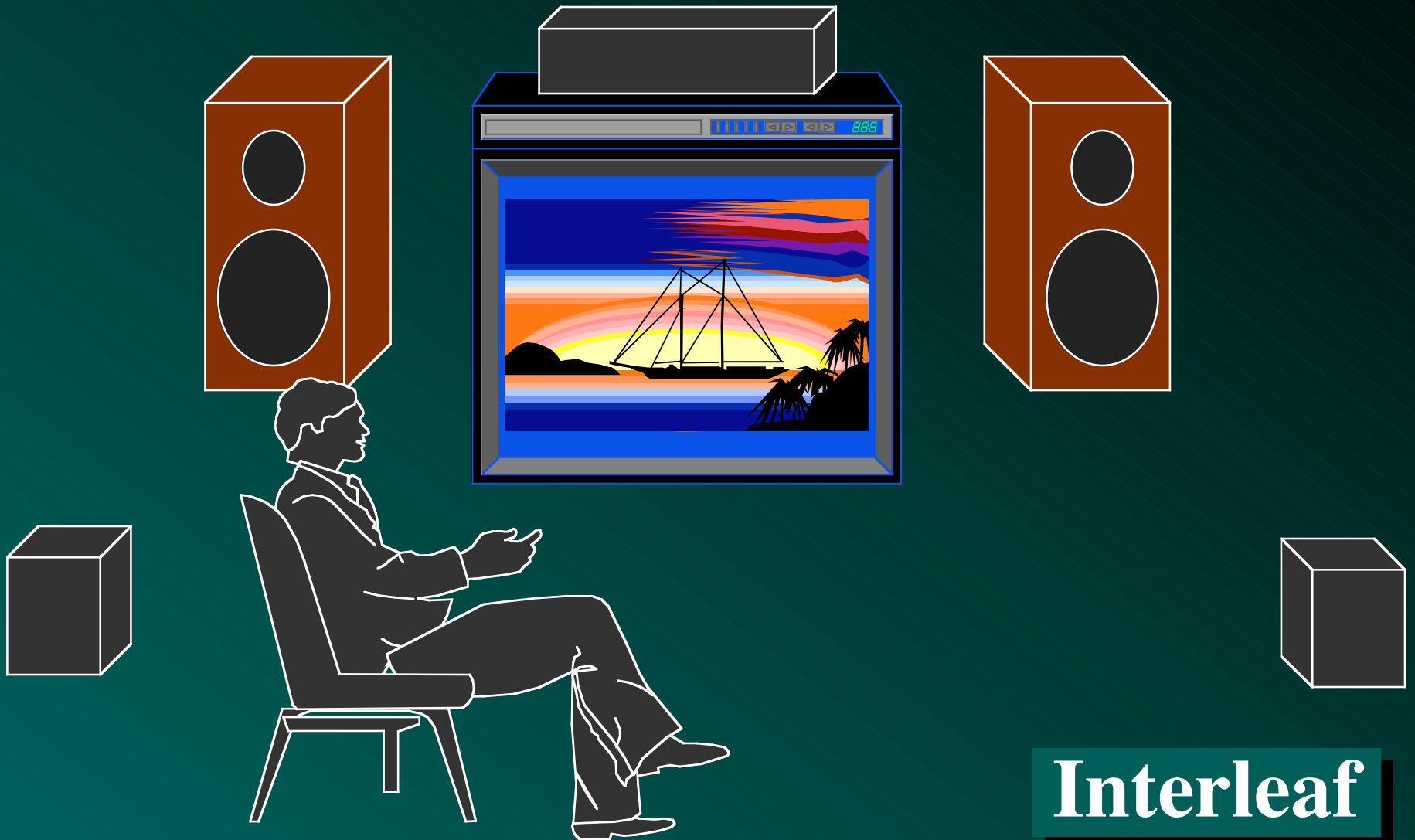
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Scalability in TV



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Scalability in TV



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Scalability in TV



Interleaf

Scalability in TV



Scalability in TV



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Scalability in TV



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What We Didn't Do

“Everyone must have a home theater system.”

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What We Didn't Do

“Everyone must have a home theater system.”

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What We Didn't Do

***“Nothing but simple
black and white.”***

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What We Didn't Do



***“Nothing but simple
black and white.”***

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Scalability in HTML

Basic HTML

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Scalability in HTML

Basic HTML

**User-defined
Subclasses**

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Scalability in HTML

Basic HTML

**User-defined
Subclasses**

Paragraph

Interleaf

Scalability in HTML

Basic HTML

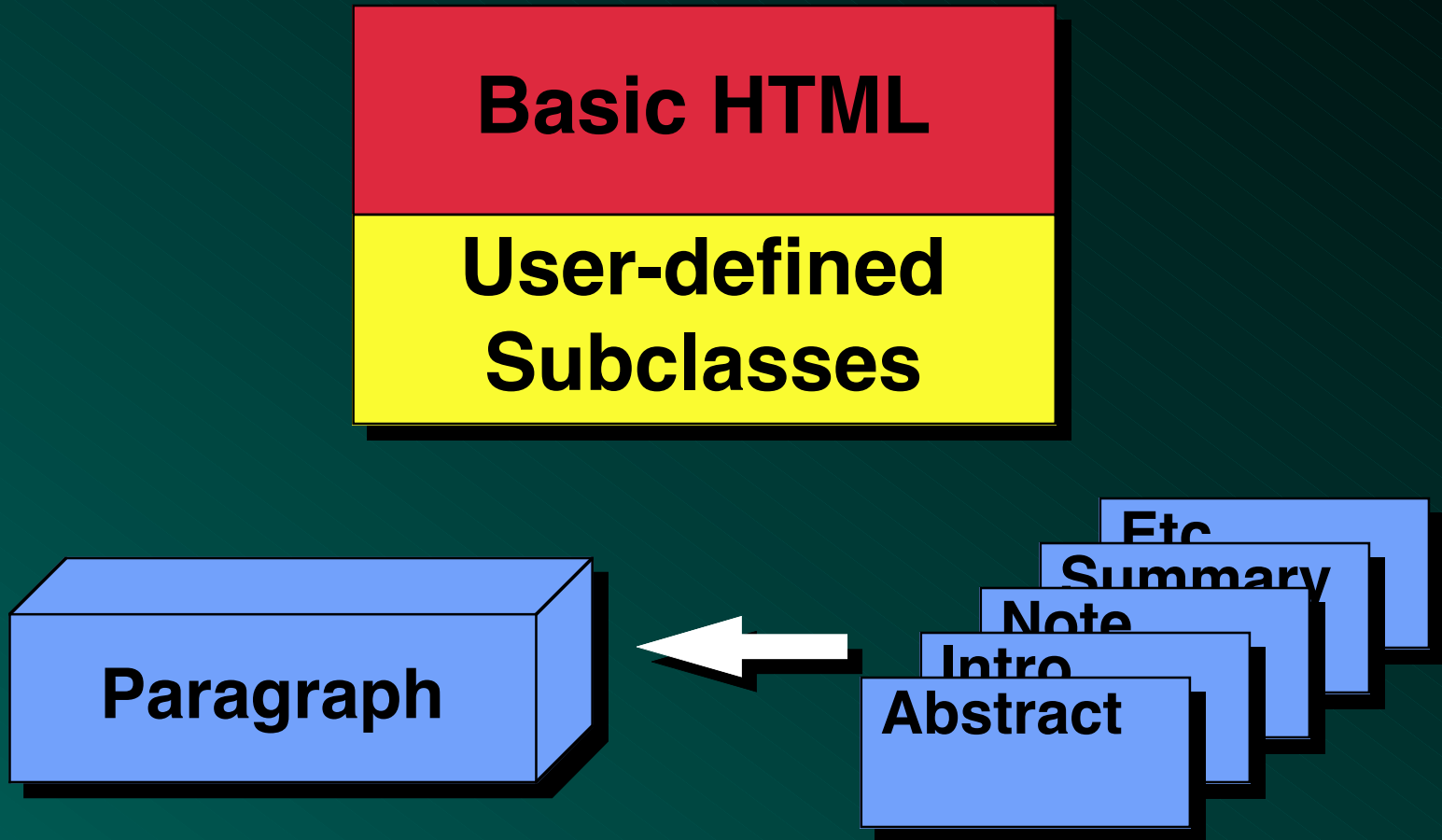
**User-defined
Subclasses**

Paragraph

act

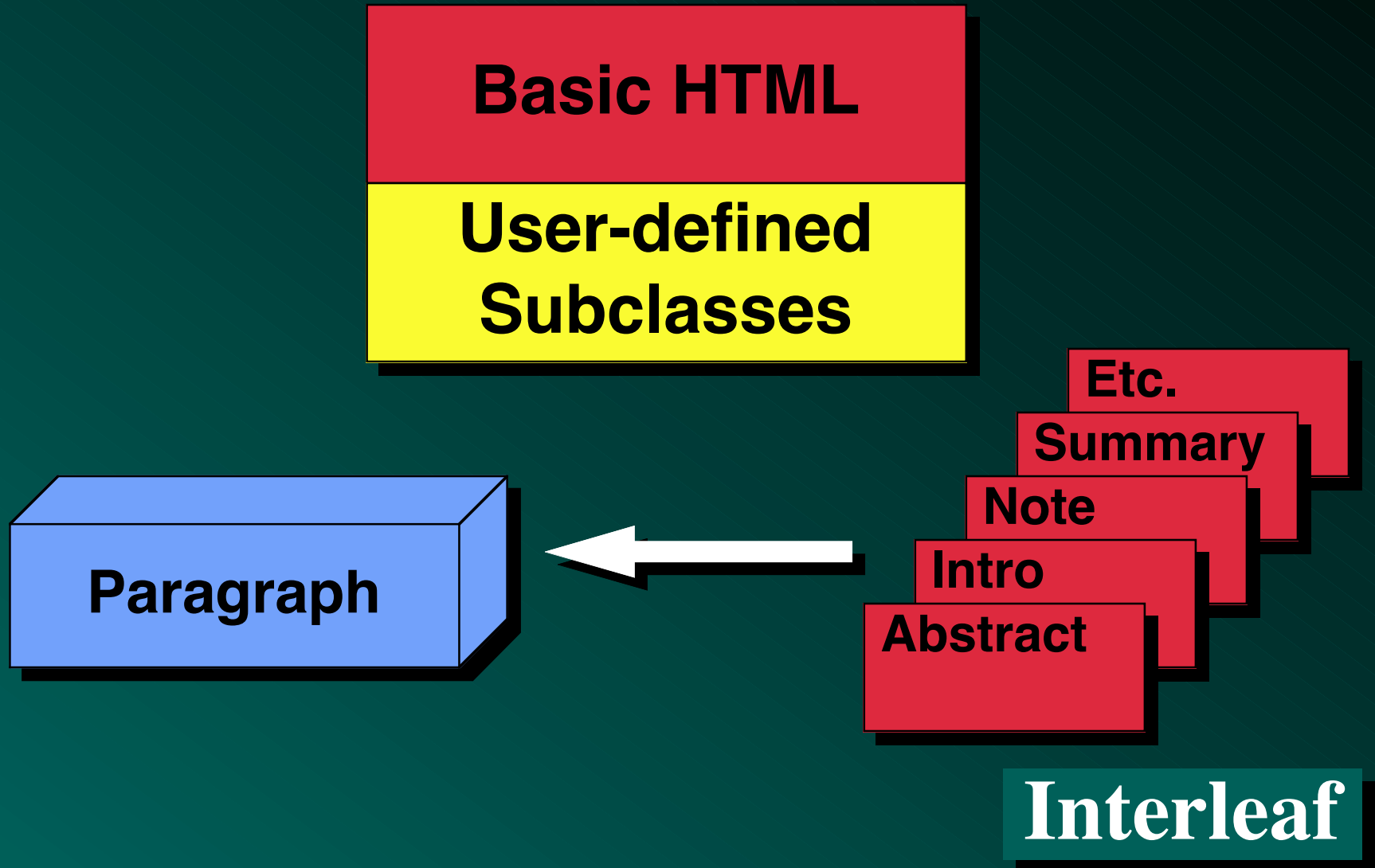
Interleaf

Scalability in HTML



Interleaf

Scalability in HTML



Scalability in HTML

Basic HTML

**User-defined
Subclasses**

Paragraph

ract

Interleaf

Scalability in HTML

Basic HTML

Paragraph

Interleaf

Scalability in HTML

**HTML
Browser**



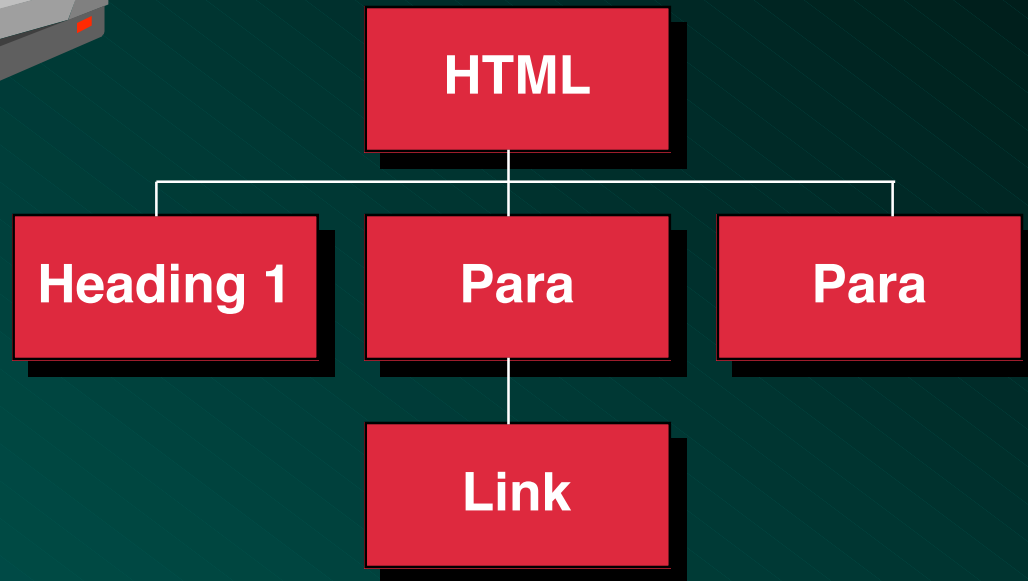
Basic HTML

Paragraph

Interleaf

Scalability in HTML

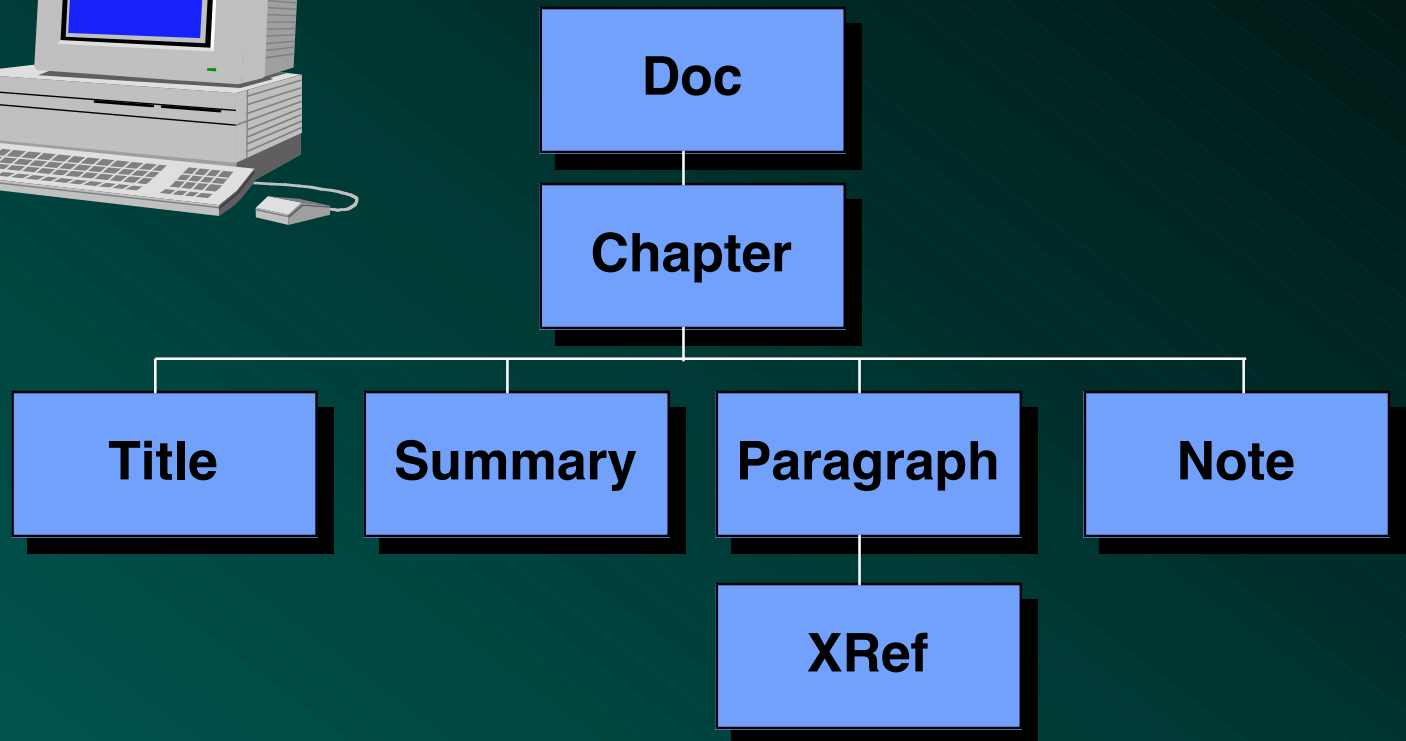
HTML
Browser



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Scalability With SGML

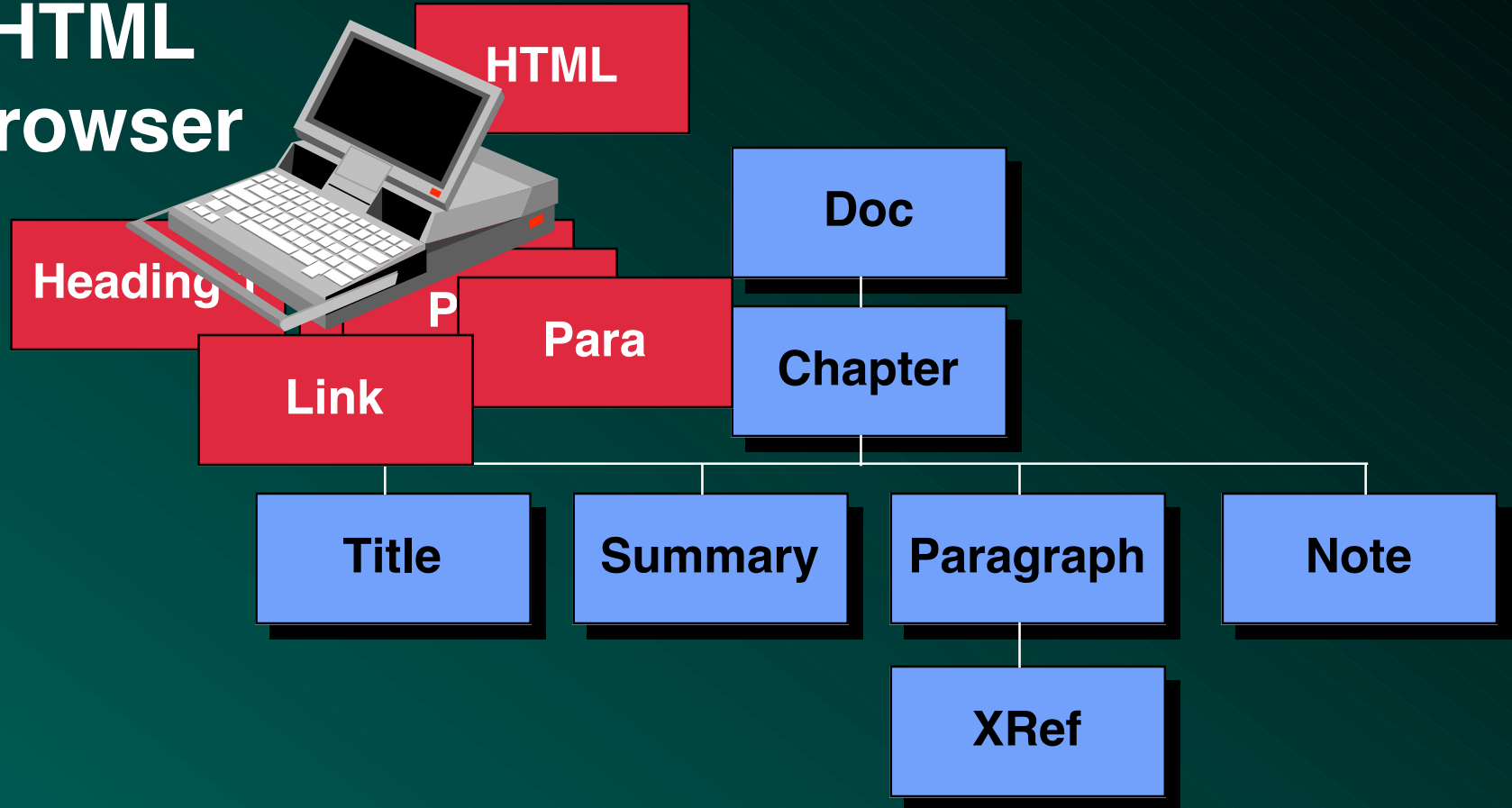
**SGML
Browser**



Interleaf

Scalability With SGML

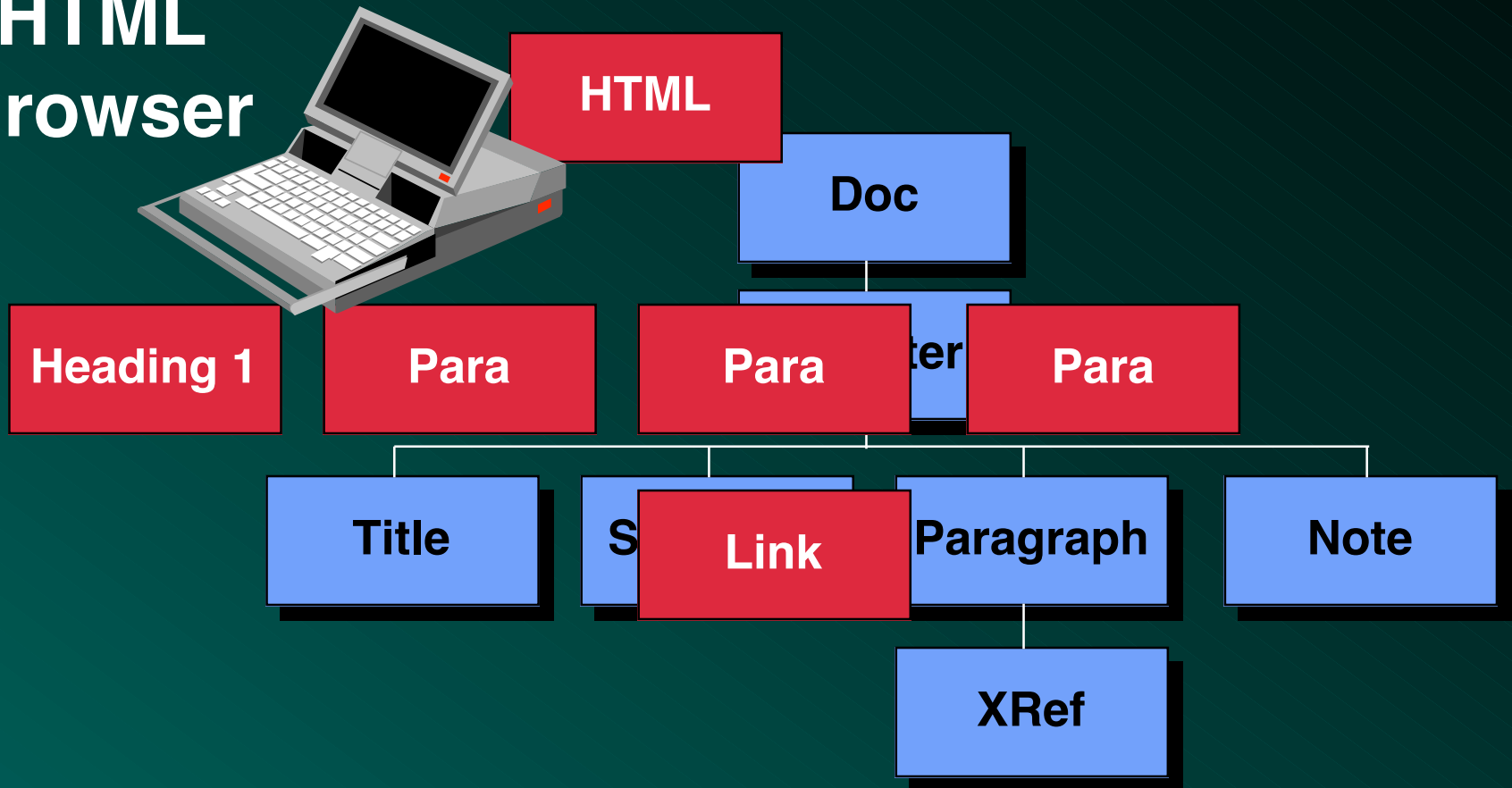
HTML
Browser



Interleaf

Scalability With SGML

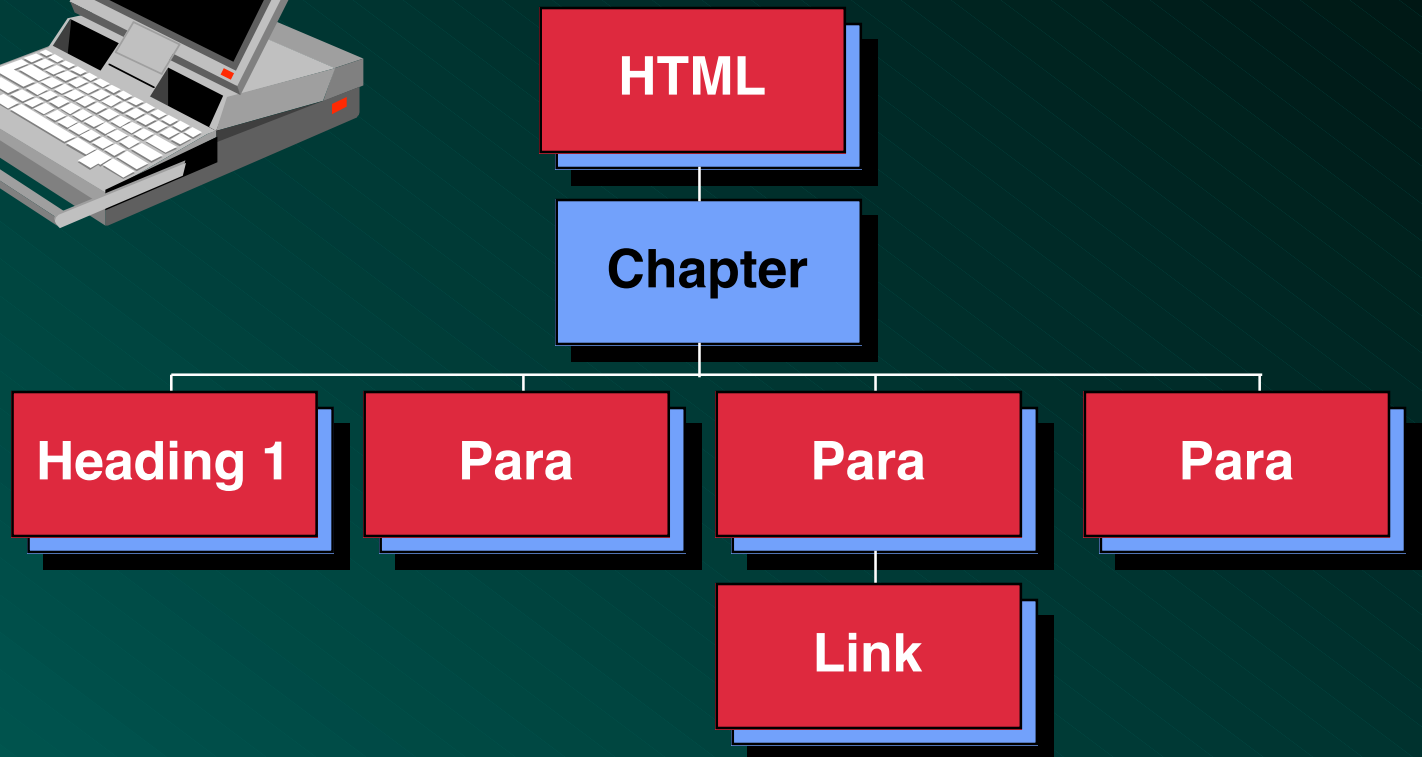
HTML
Browser



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Scalability With SGML

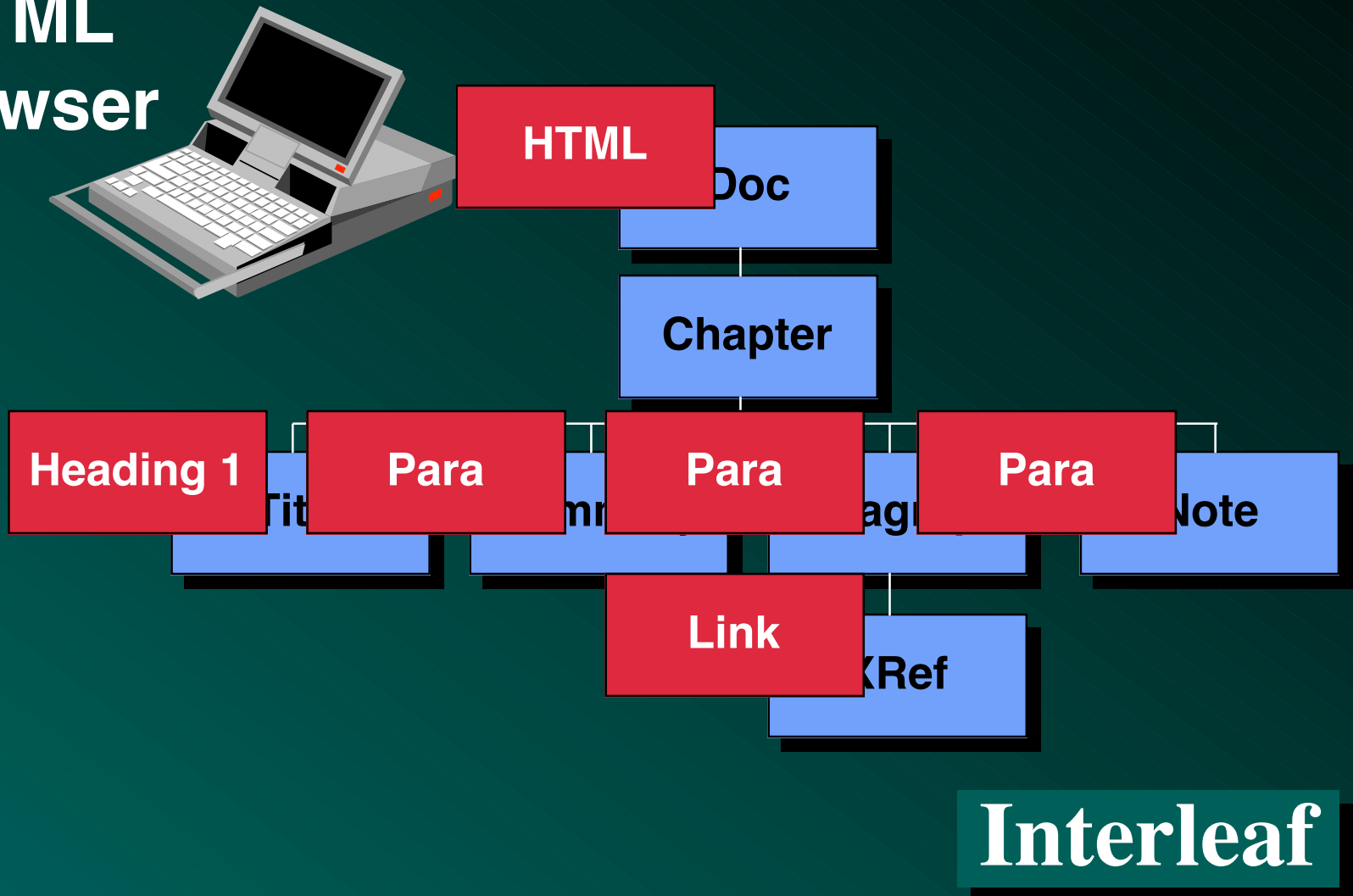
HTML
Browser



Interleaf

Scalability With SGML

HTML
Browser



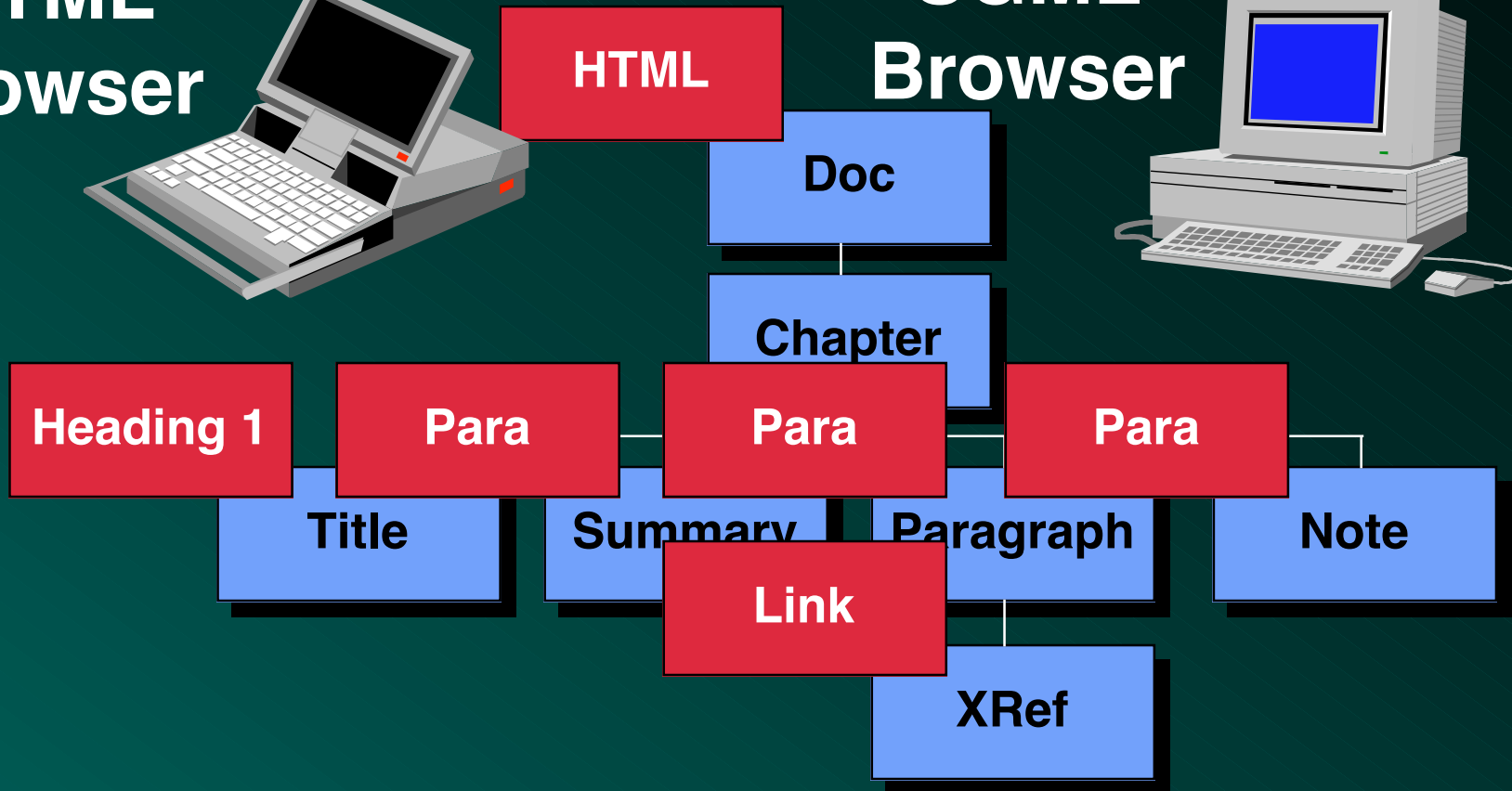
Scalability With SGML

**HTML
Browser**



HTML

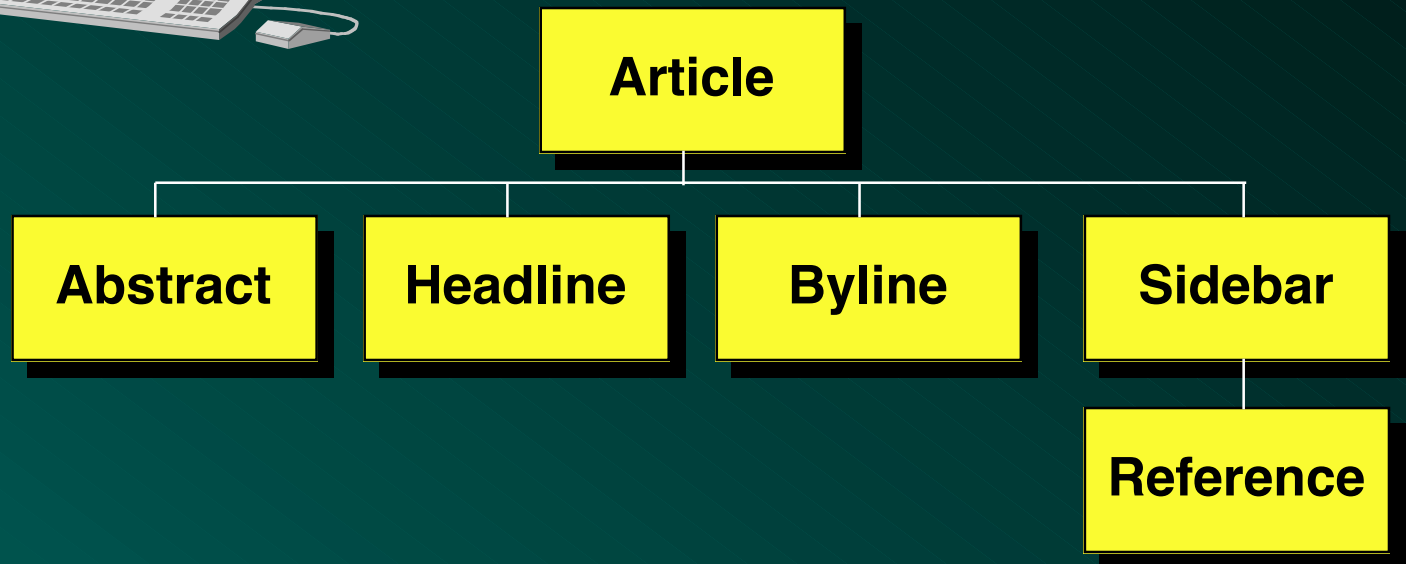
**SGML
Browser**



Interleaf

Scalability With SGML

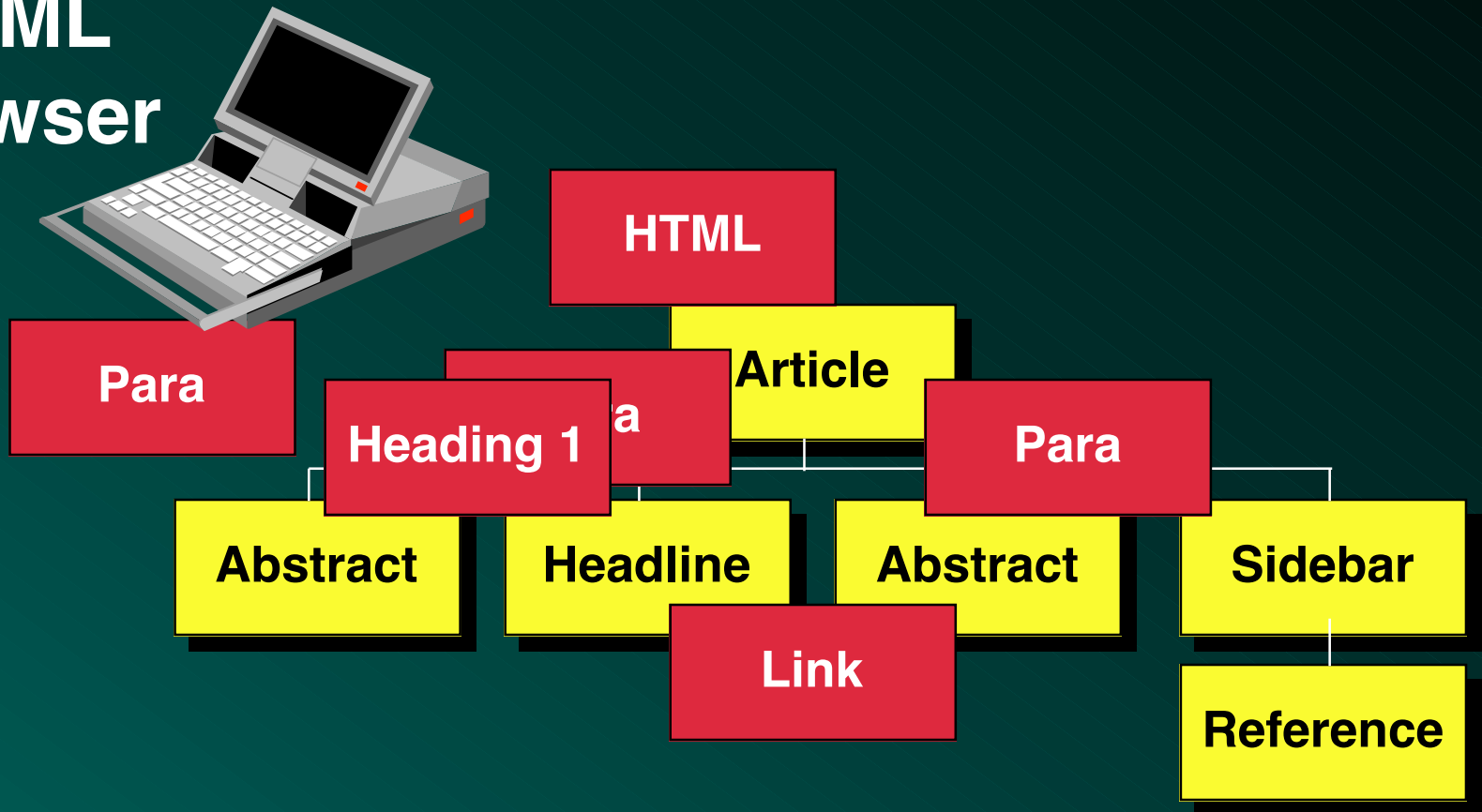
**SGML
Browser**



Interleaf

Scalability With SGML

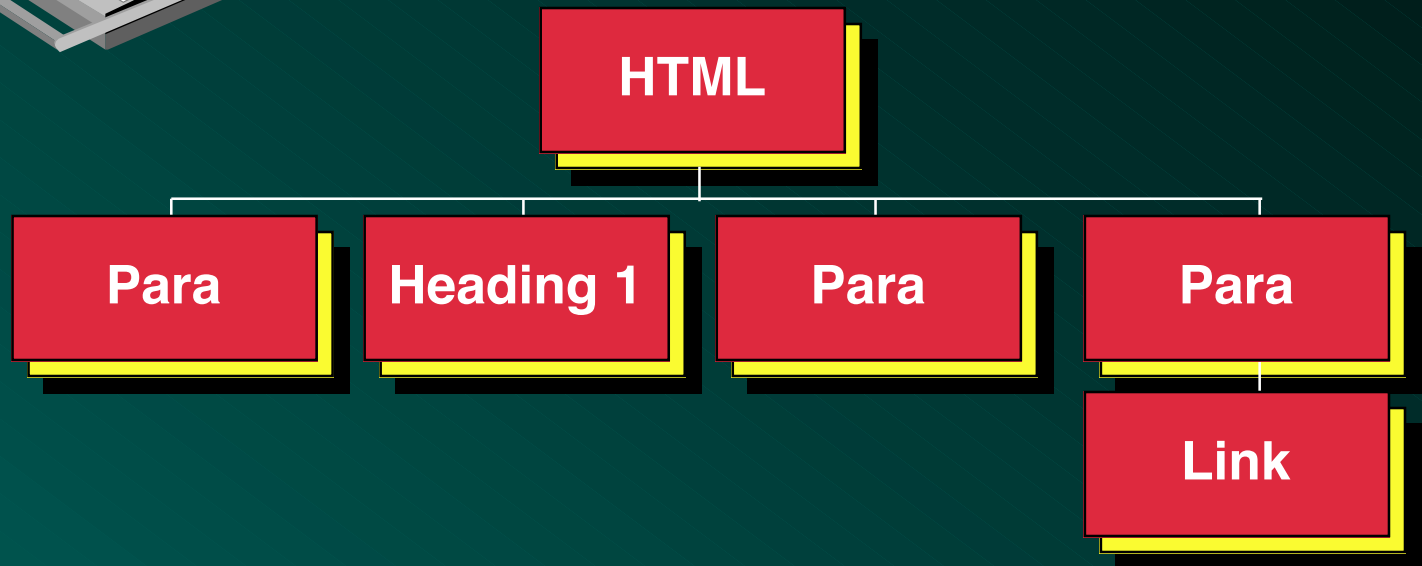
HTML
Browser



Interleaf

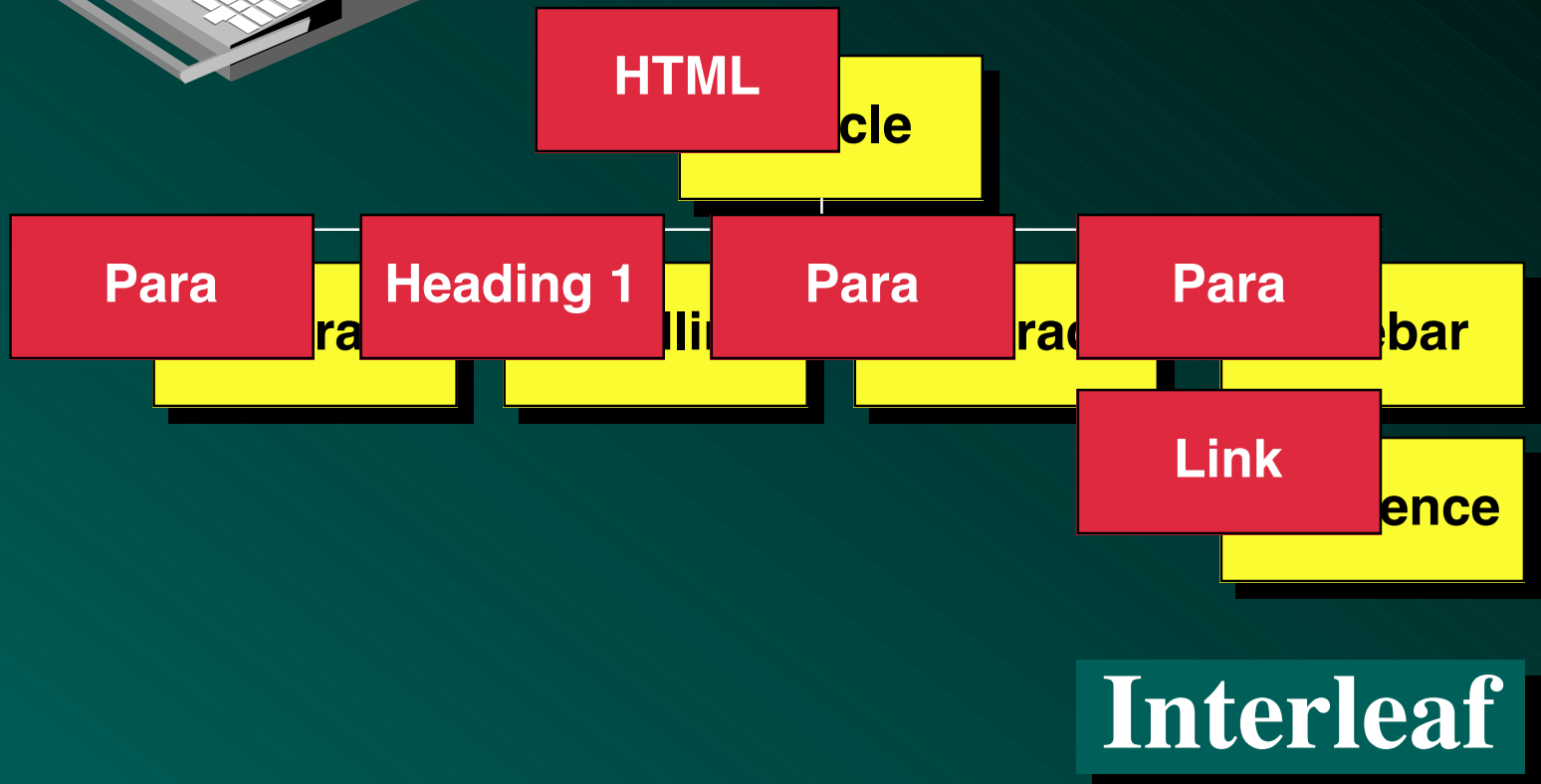
Scalability With SGML

HTML
Browser



Interleaf

HTML Browser

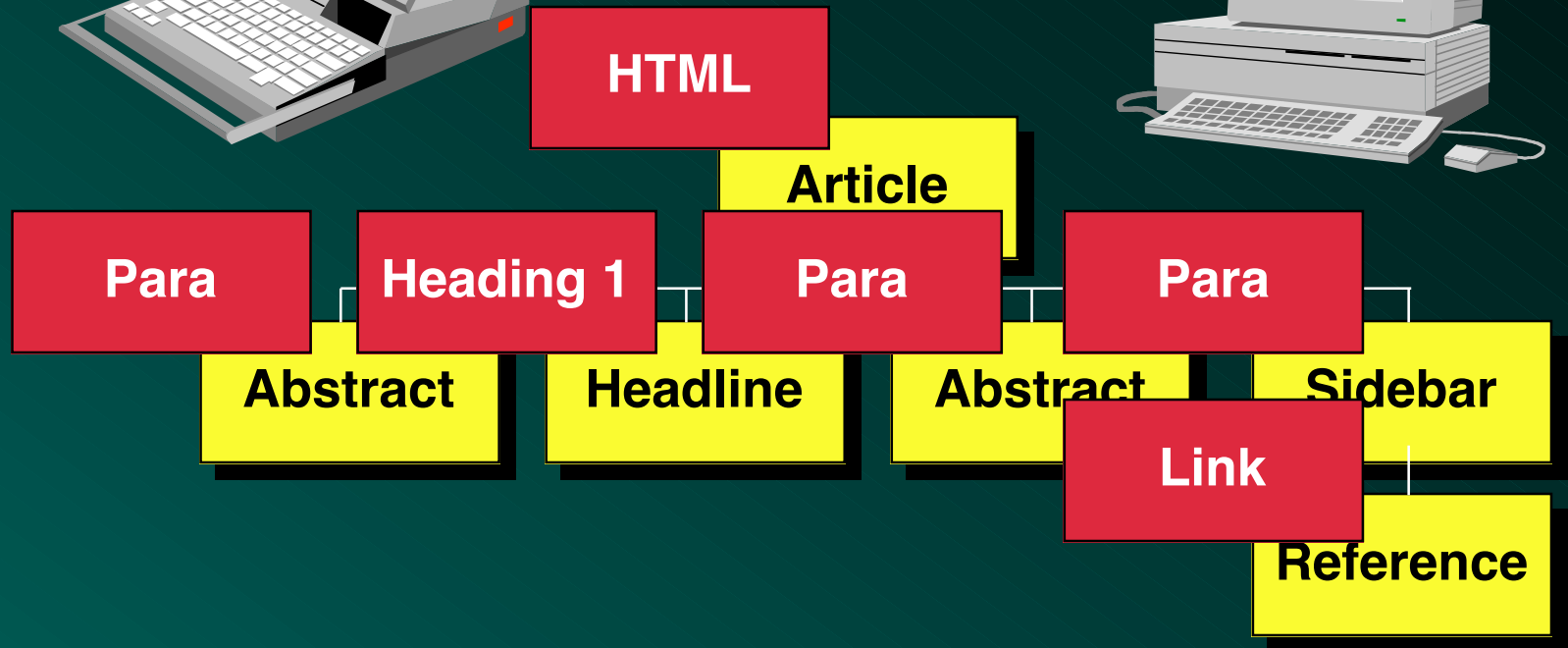


Scalability With SGML

**HTML
Browser**



**SGML
Browser**



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HTML and SGML Coexist

HTTP / MIME

HTML

SGML

**Other
Formats**

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But With Smooth Scaling...

**Basic
HTML**



**Extended
HTML**

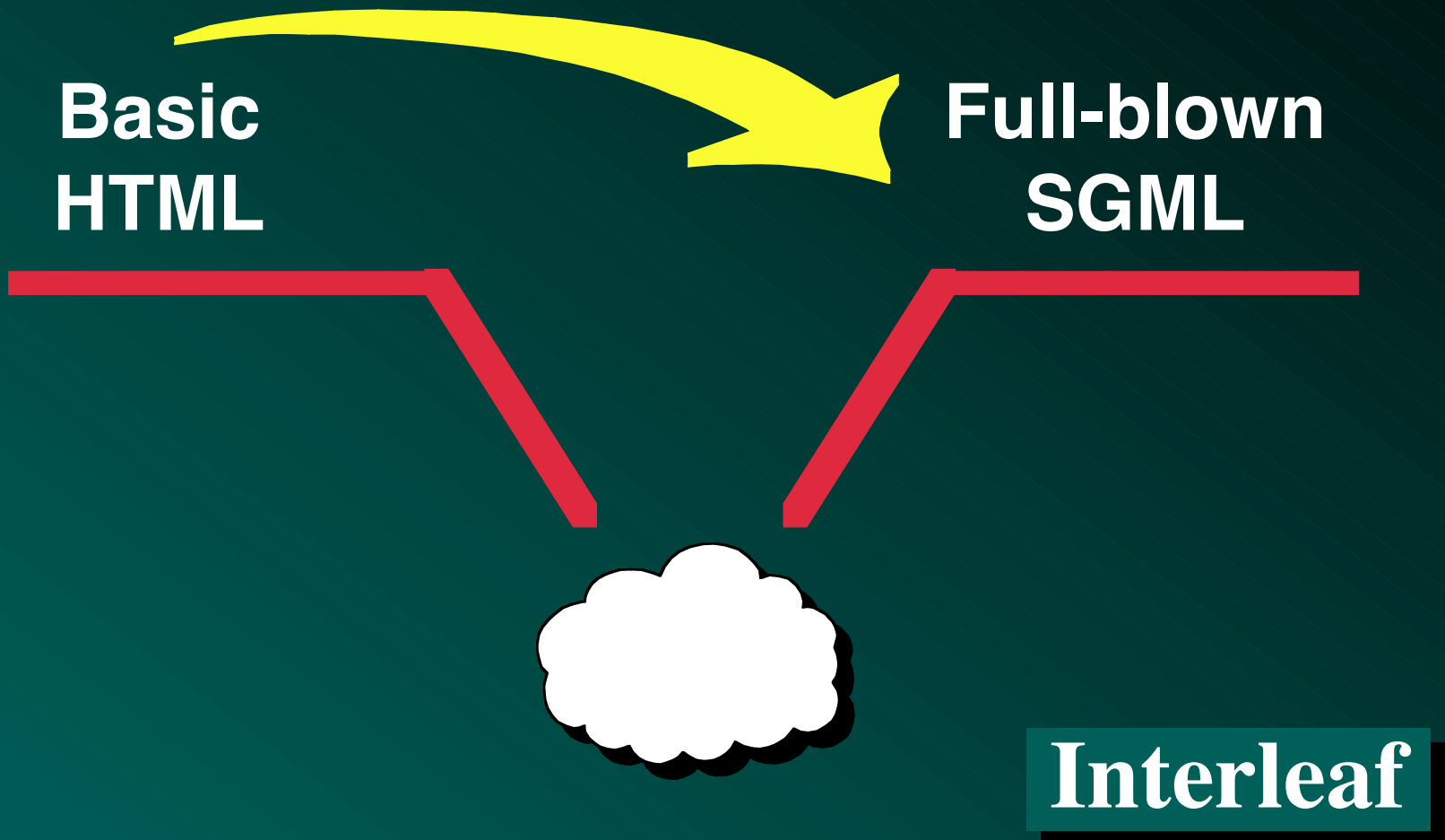


**Full-blown
SGML**

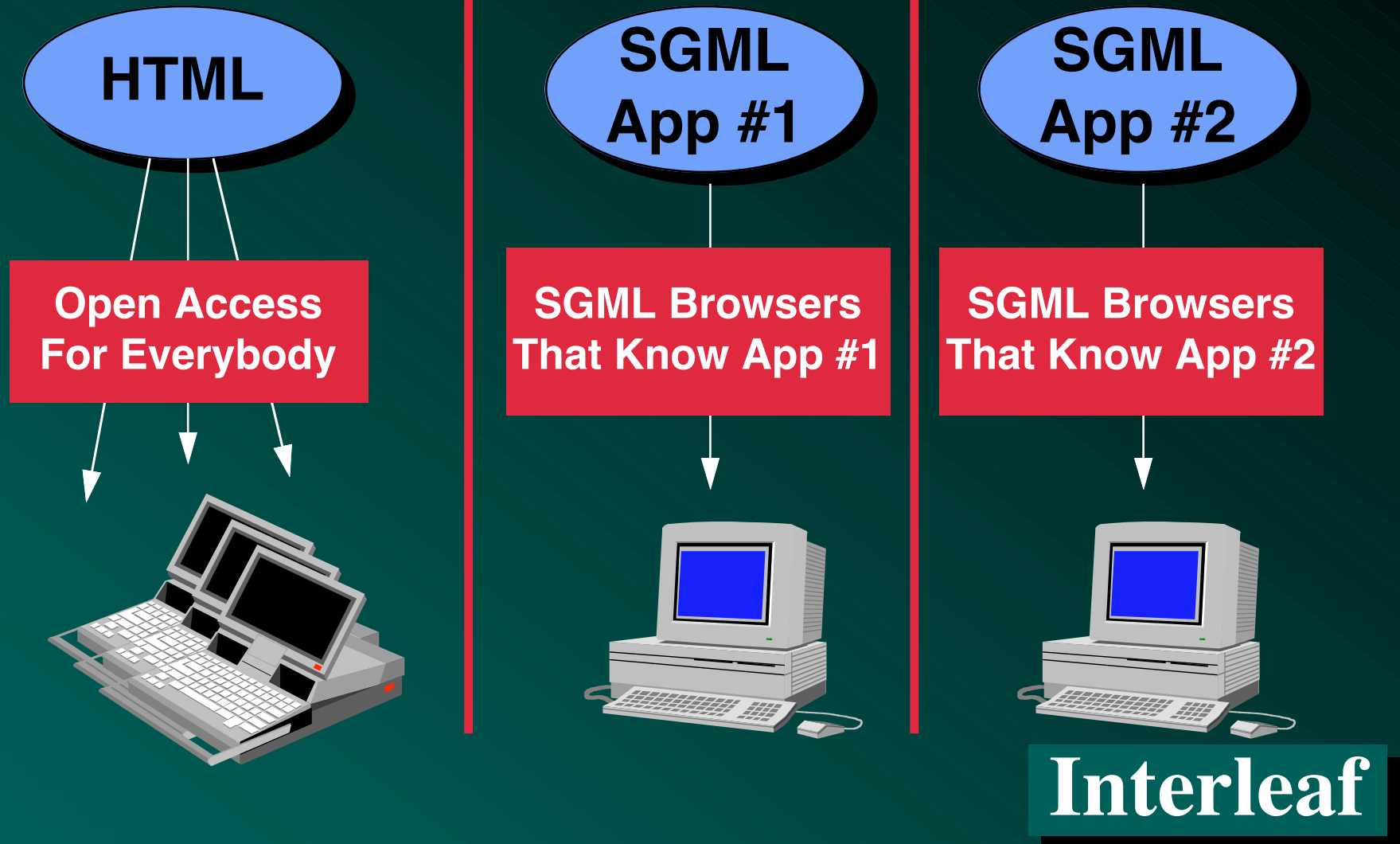


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...Not A Quantum Leap!



... Nor A Lack of Open Access



Summary

- **HTML is an SGML application**
- **Not in competition with SGML**
- **HTML is meant for electronic distribution over the Web**
- **Not for archiving data in a repository**

HTML Scalability

- But HTML can take advantage of SGML's power
- And still provide a simple backbone structure
- It is possible to build a scalable HTML / SGML web, full of power without sacrificing simplicity

Thank you, merci, danke, arigato!



erics@ileaf.com
<http://www.ileaf.com>

Interleaf

End of Presentation

Table of Contents

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SGML/HTML Tutorial

Diane Sandstrum

Regional Training Manager

Interleaf, Inc.

Agenda

- SGML Basics
- How HTML fits into SGML
 - what features are/aren't utilized
- How HTML can evolve with SGML

Goals

- To read basic components of DTD's
 - specifically the HTML DTD
- Link Eric's ideas to more concrete technical examples

First, back to what Eric said...

SGML Is About Objects

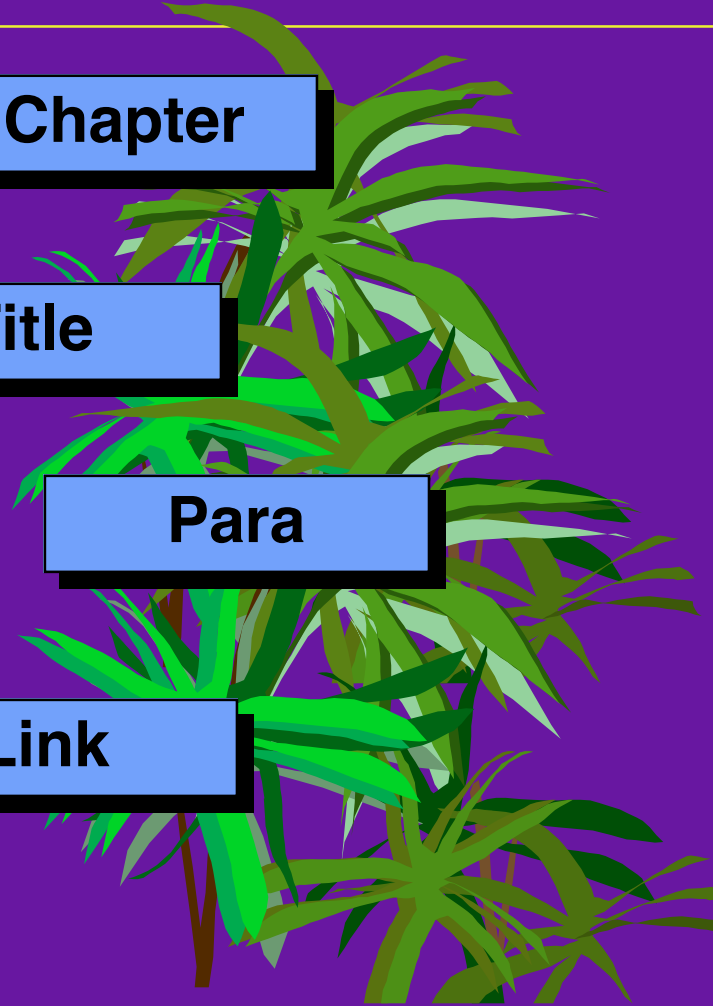


Chapter

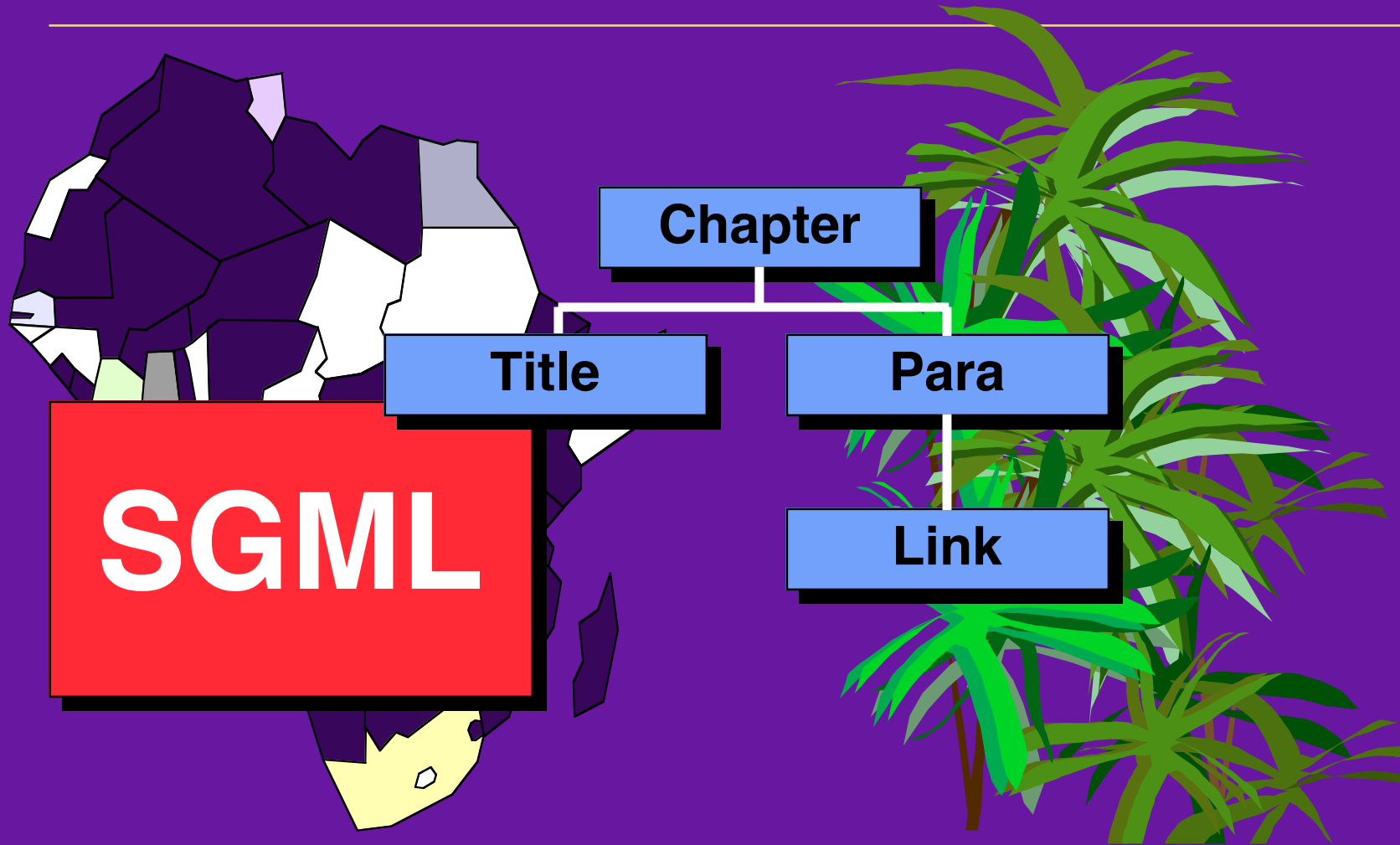
Title

Para

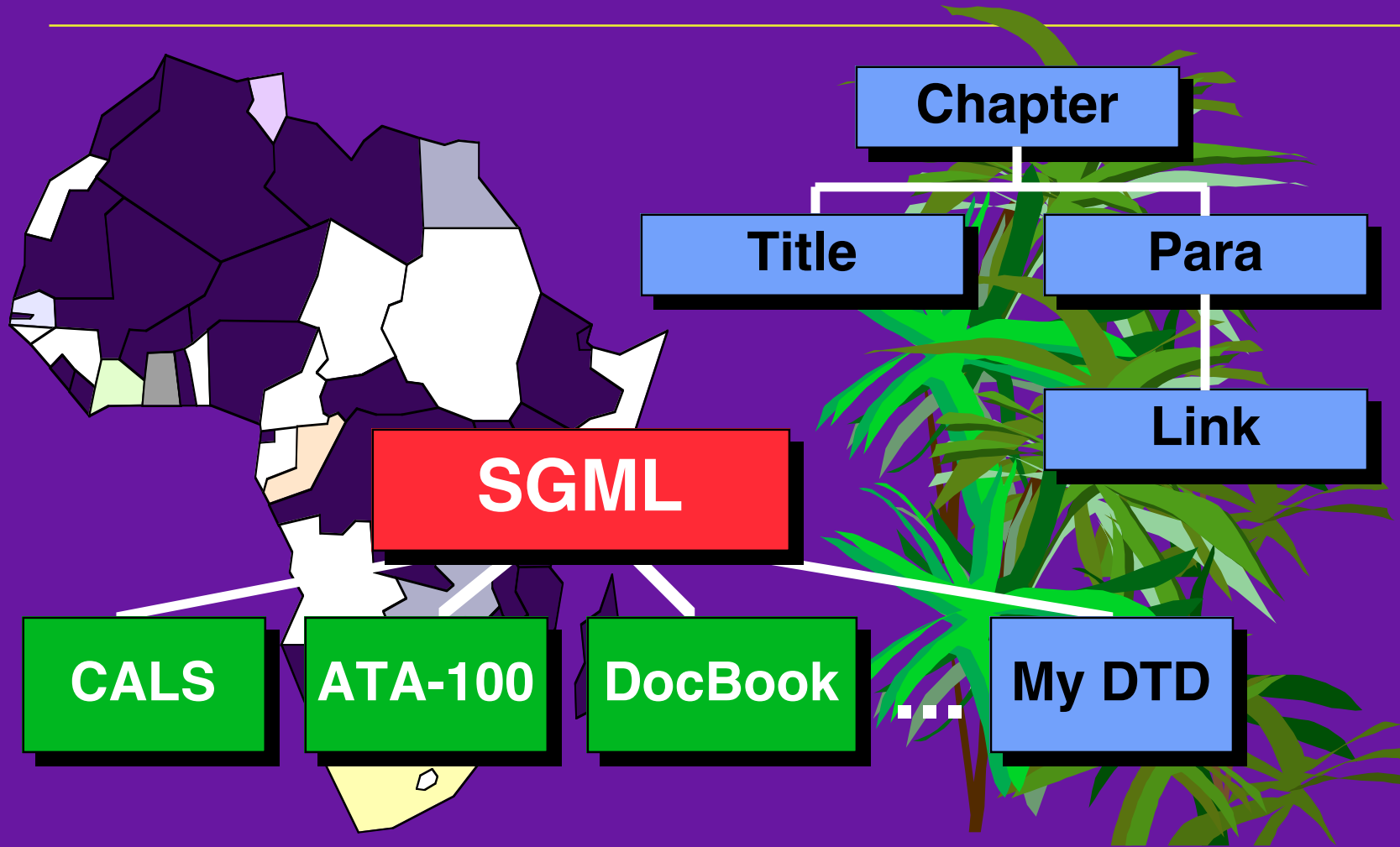
Link



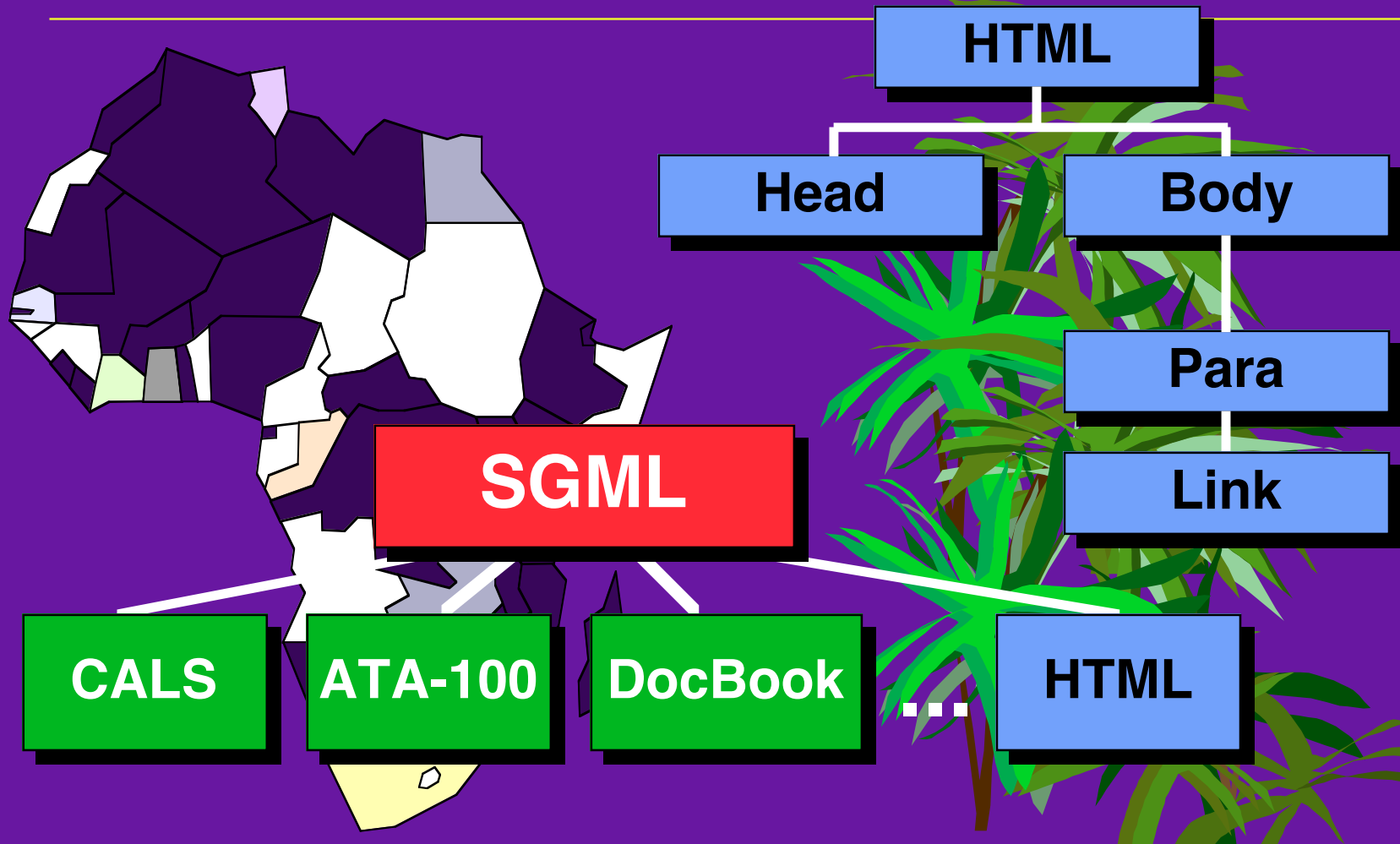
In a Defined Structure (DTD)



Each DTD Is An Application



... Including HTML



SGML Basics

- Objects
- Structure of those objects
- DTD's

What's in a DTD?

ELEMENTS

Chapter

Title

Para

Link

STRUCTURE

DOC

CHPT

SECT

PARA

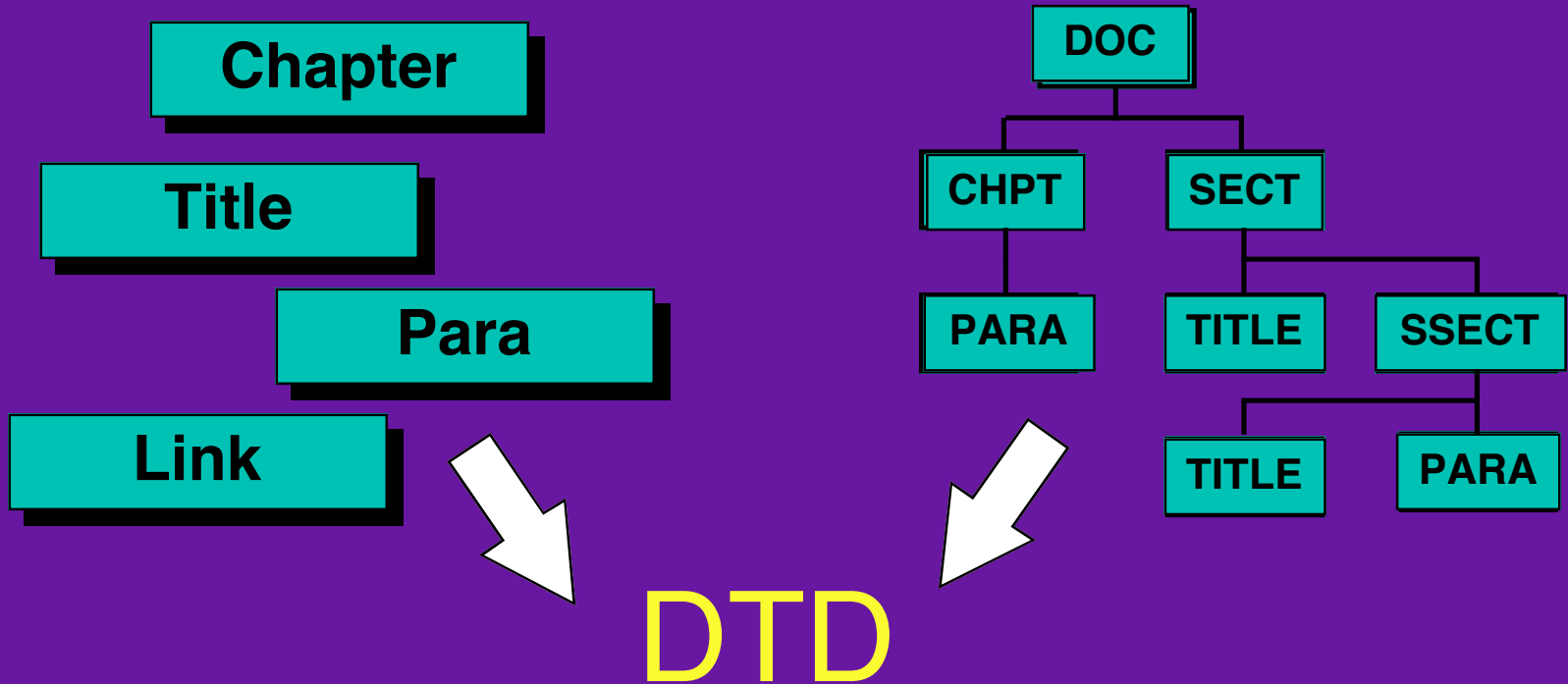
TITLE

SSECT

TITLE

PARA

DTD



What's in a DTD?

ELEMENTS

Chapter

Title

Para

Link

STRUCTURE

DOC

CHPT

SECT

PARA

TITLE

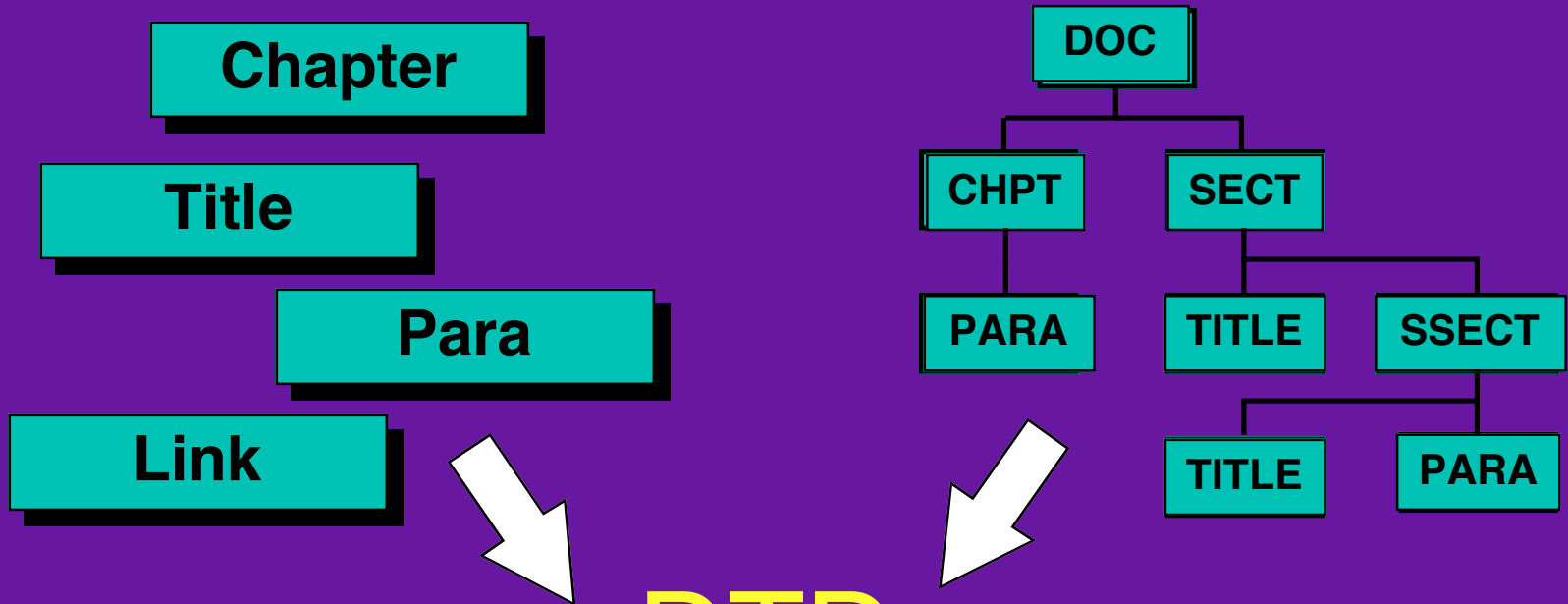
SSECT

TITLE

PARA

DTD

FORMATTING?



What's in a DTD?

ELEMENTS

Chapter

Title

Para

Link

STRUCTURE

DOC

CHPT

SECT

PARA

TITLE

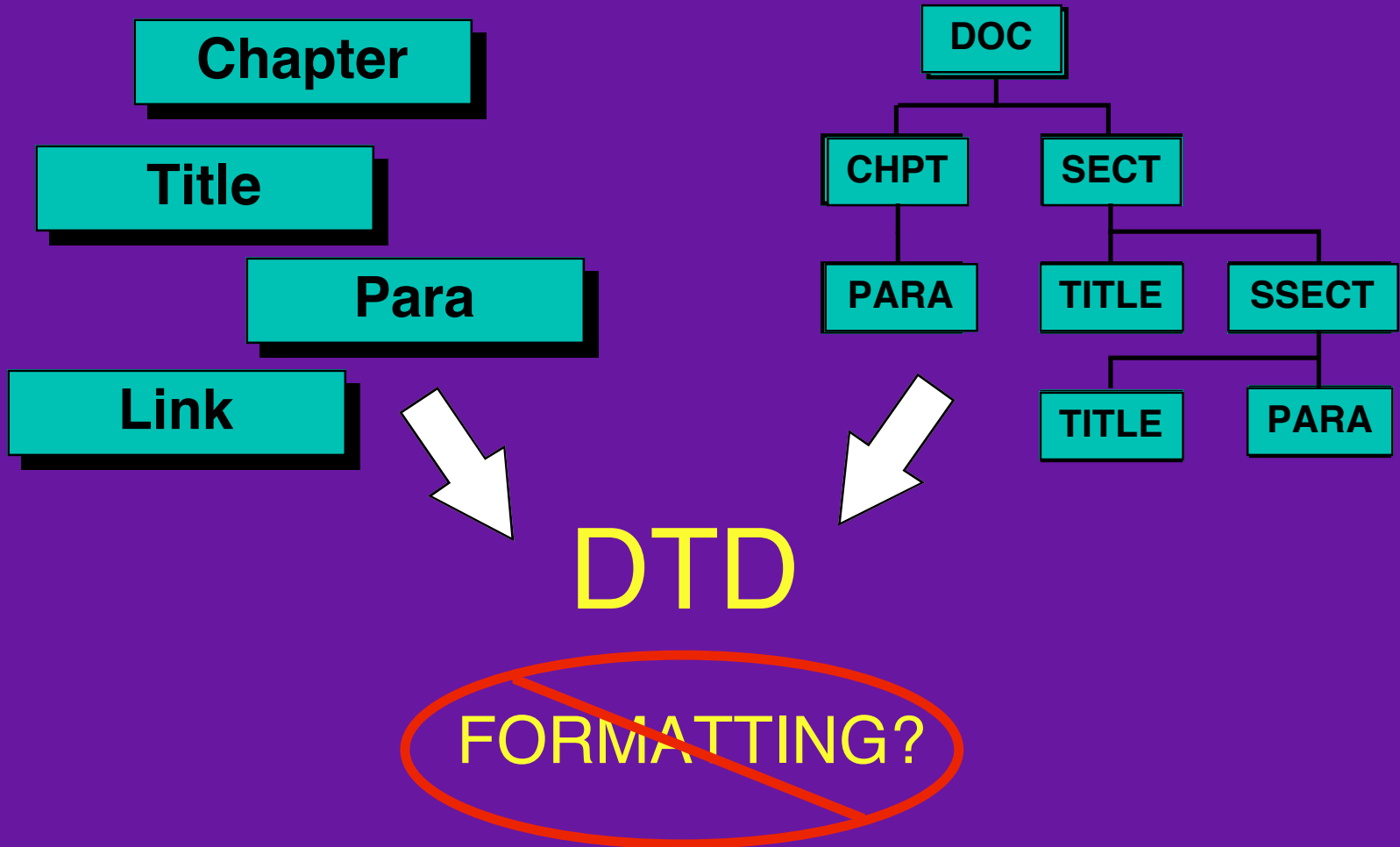
SSECT

TITLE

PARA

DTD

~~FORMATTING?~~



So what is a DTD?

- Document Type Definition (DTD)
- Provides a logical analysis of document structure, written in a known grammar
 - Identifies document elements
 - Establishes the relationship of document elements to each other
 - “Title is followed by subtitle, author, para . . .”

So what does a DTD look like?

So what does a DTD look like?

```
<!-- The following is a sample DTD. -->
<!ENTITY % paras      "(PARA|LIST)">
<!ENTITY % content     "EMPHASIS|#PCDATA">

<!ELEMENT  DOC      - - (CHPT+)                >
<!ELEMENT  CHPT     - - (TITLE, (SECT+))        >
<!ATTLIST  CHPT      label CDATA #IMPLIED>
<!ELEMENT  TITLE    - - ((%content;)+)          >
<!ELEMENT  SECT     - - (TITLE?,
                        ((%paras;)+, SSECT*)+)>
<!ATTLIST  SECT      label CDATA #IMPLIED>
<!ELEMENT  SSECT    - - (TITLE, (%paratxt;)+)>
<!ATTLIST  SSECT     label CDATA #IMPLIED>
```

And SGML markup?

```
<DOC>
<CHPT LABEL='1'><TITLE>Overview</TITLE>
<SECT><TITLE>A closer look at SGML and
HTML</TITLE>
<PARA>We'll examine SGML basics, then see
how SGML and HTML fit together.</PARA>
<PARA>Then we'll discuss how SGML and
HTML could evolve together.</PARA>
</SECT>
</CHPT>
</DOC>
```

And HTML markup?

```
<HTML>
<HEAD><TITLE>Overview</TITLE></HEAD>
<BODY><H1>A closer look at SGML and
HTML</H1>
<P>We'll examine SGML basics, then see
how SGML and HTML fit together.</P>
<P>Then we'll discuss how SGML and
HTML could evolve together.</P>
</BODY>
</HTML>
```

Same basic markup, but different tags are used

Main DTD components

- Elements
- Attributes
- Entities

Sample DTD

```
<!-- The following is a sample DTD. -->  
<!ENTITY % paras      "(PARA|LIST)">  
<!ENTITY % content     "EMPHASIS|#PCDATA">
```

```
<!ELEMENT  DOC      - - (CHPT+)                >  
<!ELEMENT  CHPT     - - (TITLE, (SECT+))        >  
<!ATTLIST  CHPT      label CDATA #IMPLIED>  
<!ELEMENT  TITLE    - - ((%content;)+)         >  
<!ELEMENT  SECT     - - (TITLE?,  
                        ((%paras;)+, SSECT*))+>  
<!ATTLIST  SECT      label CDATA #IMPLIED>  
<!ELEMENT  SSECT    - - (TITLE, (%paratxt;)+)>  
<!ATTLIST  SSECT     label CDATA #IMPLIED>
```

Sample DTD

```
<!-- The following is a sample DTD. -->
<!ENTITY % paras      "(PARA|LIST)">
<!ENTITY % content     "EMPHASIS|#PCDATA">

<!ELEMENT  DOC      - - (CHPT+)                >
<!ELEMENT  CHPT     - - (TITLE, (SECT+))        >
<!!ATTLIST CHPT      label CDATA #IMPLIED>
<!ELEMENT  TITLE    - - ((%content;)+)          >
<!ELEMENT  SECT     - - (TITLE?,
                        (%paras;)+, SSECT* )+ )>
<!!ATTLIST SECT      label CDATA #IMPLIED>
<!ELEMENT  SSECT    - - (TITLE, (%paratxt;)+)>
<!!ATTLIST SSECT     label CDATA #IMPLIED>
```


Sample DTD

```
<!-- The following is a sample DTD. -->
```

```
<!ENTITY % paras      "(PARA|LIST)">
```

```
<!ENTITY % content     "EMPHASIS|#PCDATA">
```

```
<!ELEMENT  DOC      - - (CHPT+)                >
```

```
<!ELEMENT  CHPT     - - (TITLE, (SECT+))        >
```

```
<!ATTLIST  CHPT      label CDATA #IMPLIED>
```

```
<!ELEMENT  TITLE    - - ((%content;)+)         >
```

```
<!ELEMENT  SECT      - - (TITLE?,  
                           ((%paras;)+, SSECT* )+)>
```

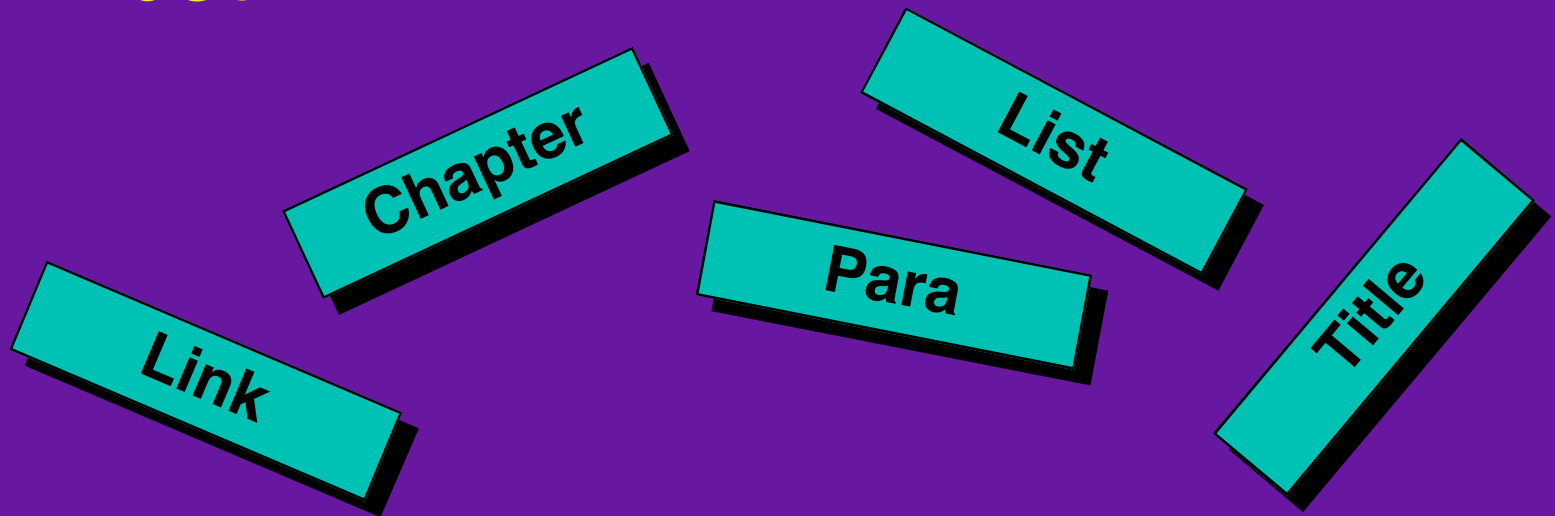
```
<!ATTLIST  SECT      label CDATA #IMPLIED>
```

```
<!ELEMENT  SSECT    - - (TITLE, (%paratxt;)+)>
```

```
<!ATTLIST  SSECT     label CDATA #IMPLIED>
```

ELEMENTS

- Identify the specific pieces of the documents
- Contain data, other elements, or both



ELEMENTS - the markup

```
<chapter>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used.  The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

BEGIN TAG

<chapter>

<title>

END TAG

</chapter>

</title>

ELEMENTS - the structure

```
<chapter>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

- CHAPTER contains other elements (title, para).
- TITLE contains data characters.
- PARA contains data characters and an embedded emph element.

Element Declaration

- Defines an element and its content
- Describes how many times and when elements occur
- SGML Syntax:

```
<!ELEMENT name content_model>
```

Content Model

- Defines the content of an element

OTHER ELEMENTS:

```
<!ELEMENT chapter (title, para)>
```

DATA:

```
<!ELEMENT title (#PCDATA)>
```

DATA AND OTHER ELEMENTS:

```
<!ELEMENT para (#PCDATA | EMPH) *>
```

The DTD

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title   (#PCDATA)>
<!ELEMENT para    (#PCDATA|EMPH)*>
<!ELEMENT emph    (#PCDATA)>
```

The DTD and the markup

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title    (#PCDATA)>
<!ELEMENT para     (#PCDATA|EMPH)*>
<!ELEMENT emph     (#PCDATA)>
```

```
<chapter>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```


The DTD and the markup

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title   (#PCDATA)>
<!ELEMENT para    (#PCDATA|EMPH)*>
<!ELEMENT emph    (#PCDATA)>
```

```
<chapter>
```

```
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
```

```
</chapter>
```

The DTD and the markup

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title    (#PCDATA)>
<!ELEMENT para     (#PCDATA|EMPH)*>
<!ELEMENT emph     (#PCDATA)>
```

```
<chapter>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used.  The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

The DTD and the markup

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title   (#PCDATA)>
<!ELEMENT para    (#PCDATA|EMPH)*>
<!ELEMENT emph    (#PCDATA)>
```

<chapter>

<title>Introduction to SGML**</title>**

<para>This gives you an overview of how SGML is used. The DTD defines the **<emph type='i'>structure</emph>** of the elements.**</para>**

</chapter>

The DTD and the markup

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title    (#PCDATA)>
<!ELEMENT para     (#PCDATA|EMPH)*>
<!ELEMENT emph     (#PCDATA)>
```

```
<chapter>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

The DTD and the markup

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title    (#PCDATA)>
<!ELEMENT para     (#PCDATA|EMPH)*>
<!ELEMENT emph     (#PCDATA)>
```

```
<chapter>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

The DTD and the markup

```
<!ELEMENT chapter (title, para)>
<!ELEMENT title    (#PCDATA)>
<!ELEMENT para     (#PCDATA|EMPH)*>
<!ELEMENT emph     (#PCDATA)>
```

```
<chapter>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

The DTD and the markup

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<!ELEMENT chapter (title, para)>
<!ELEMENT title    (#PCDATA)>
<!ELEMENT para     (#PCDATA | EMPH) *>
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<!ELEMENT emph     (#PCDATA)>
```

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<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

Structure and Order

- Defined in the content model
 - Special notations used
- Can specify:
 - Required?
 - Number of times
 - Order of elements

SGML Notation

- Ordering indicators:
 - , All must occur in the order entered
 - | Select one of alternatives
 - & All must occur in any order

```
<!ELEMENT letter (opening,body,closing)>
```

```
<!ELEMENT list (bullitems | numitems)>
```

```
<!ELEMENT memo (to & from & date),body)>
```

SGML Notation

- Occurance indicators:

- ? Optional (0 or 1 times)

- * Optional and repeatable (0 or more)

- + Required and repeatable (1 or more)

```
<!ELEMENT manual (title,chapter+,index?)>
```

```
<!ELEMENT para (title?,para,  
                (subpara,subpara+)?)>
```

```
<!ELEMENT order (appetizer*,soup?,  
                entree,dessert+)>
```

Using SGML Elements

- **Variety**
 - Define what you need
 - More robust documents (now or reuse)
 - Search & retrieval
- **Structure**
 - Defined and validated

Many Objects vs. One Object

SGML

Abstract

Intro

Preface

Note

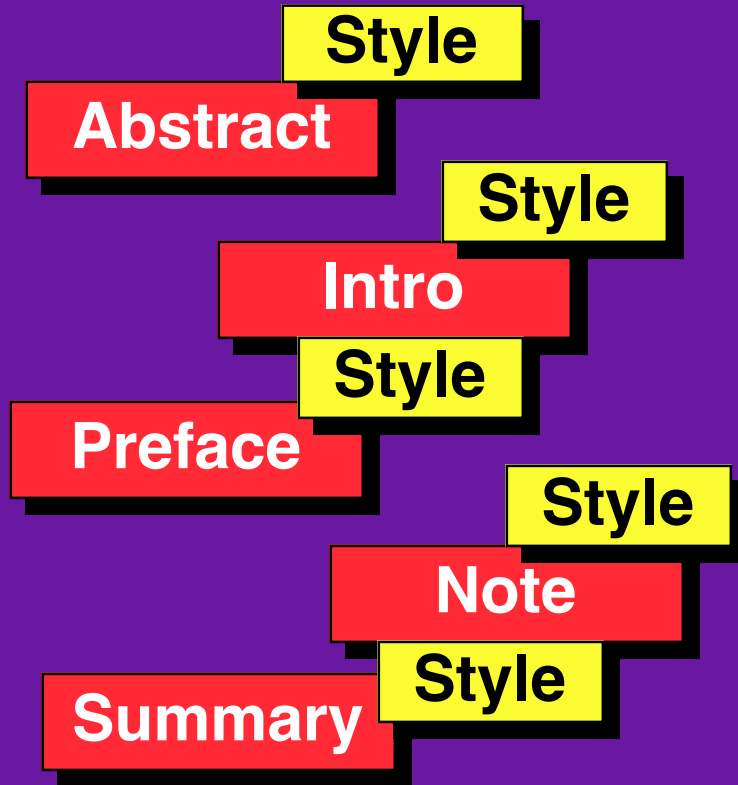
Summary

HTML

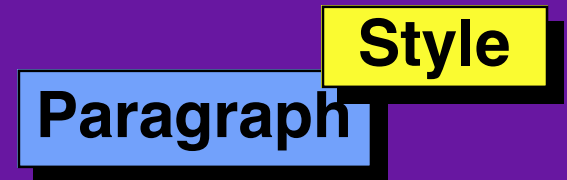
Paragraph

Many Formats vs. One Format

SGML



HTML



Same for Search and Reuse

SGML

Title

Abstract

Intro

Preface

Note

Summary

HTML

Title

Paragraph

Paragraph

Paragraph

Paragraph

Paragraph

One or Many Elements

ONE:

```
<!ELEMENT body      (para)+>
<!ELEMENT para      (#PCDATA)>
```

OR MANY:

```
<!ELEMENT body      (para|note|warning|
                    abstract|intro)+>
<!ELEMENT para      (#PCDATA)>
<!ELEMENT note      (#PCDATA)>
<!ELEMENT warning    (#PCDATA)>
<!ELEMENT abstract   (#PCDATA)>
<!ELEMENT intro      (#PCDATA)>
```

A Variety of formats

A Closer Look at Element Usage

ABSTRACT: A discussion of how you can benefit from using a variety of elements in your documents.

Without having many element types, you don't have the ability to visually distinguish between the paragraphs.

A simple note paragraph.

This is a warning statement.

Compare the visual differences between viewing paragraphs in all the same format and those of a different "types" formatted differently.

One Paragraph Type HTML

Many Paragraph Types SGML

A Closer Look at Element Usage

ABSTRACT: A discussion of how you can benefit from using a variety of elements in your documents|

Introduction

Without having many element types, you don't have the ability to visually distinguish between the paragraphs.

NOTE: A simple note paragraph.

WARNING: This is a warning statement.

SUMMARY

Compare the visual differences between viewing paragraphs in all the same format and those of a different "types" formatted differently.

Search and Retrieval



Gather all the
ABSTRACTS ...

HTML

Title

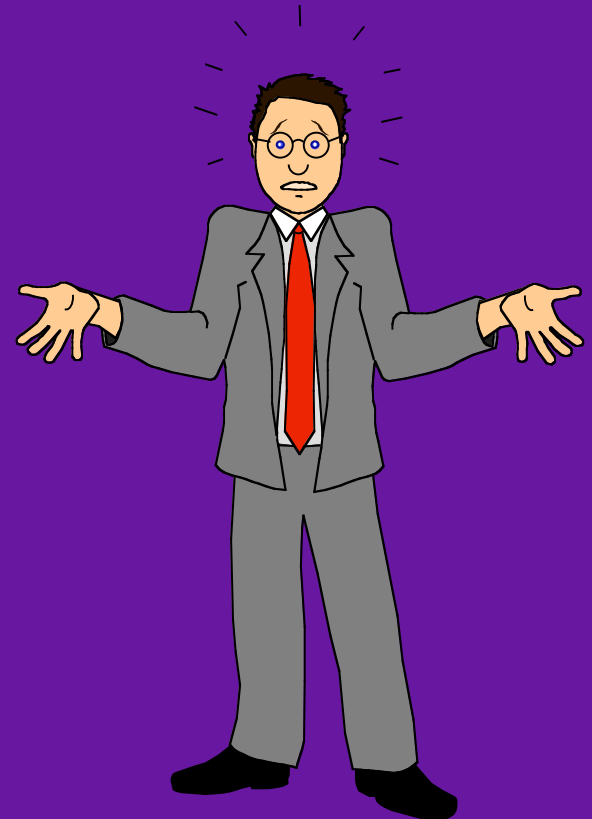
Paragraph

Paragraph

Paragraph

Paragraph

Paragraph



Search and Retrieval



Gather all the
ABSTRACTS ...

SGML

Title

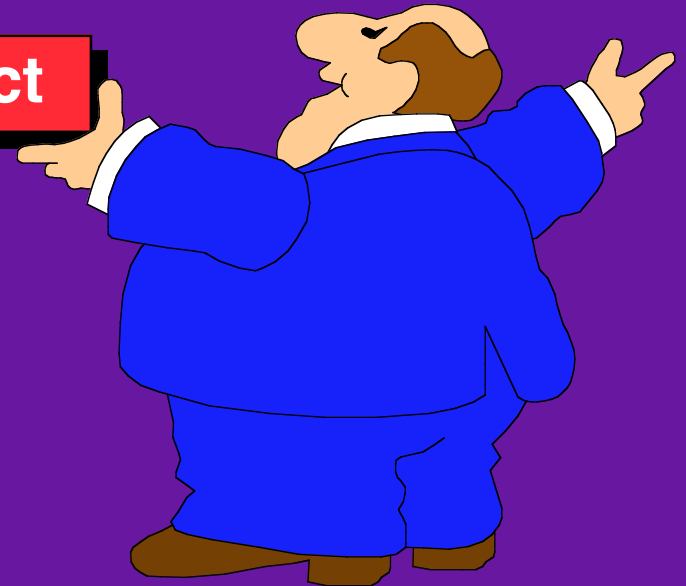
Abstract

Intro

Preface

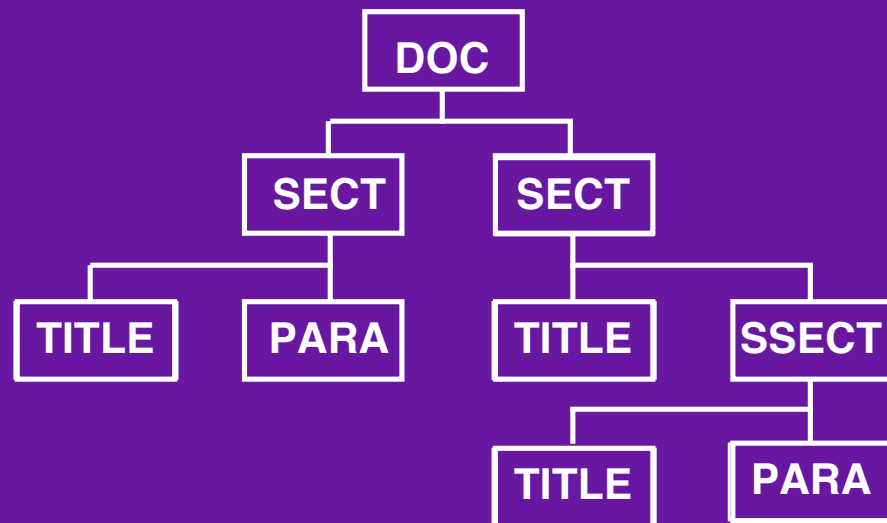
Note

Summary



Document Structure

- Element declarations allow us to define the rules of the hierarchical structure of our documents



Structure Validation

- All SGML documents must be verified (parsed)
- Some information is **REQUIRED**
 - Can cause costly mistakes or serious errors if information is left out
- Maintains document integrity

The importance of verified structure ...

Those **WARNING** statements never made it into the print... I told you those were **REQUIRED!!**



Value of SGML elements:

- Focused search and retrieval
- Component level management
- Validated structure
- Flexible reuse
- Rich, robust documents

Attributes

ATTRIBUTES - the markup

```
<chapter id='ch1'>
<title>Introduction to SGML</title>
<para>This gives you an overview of
how SGML is used. The DTD defines
the <emph type='i'>structure</emph>
of the elements.</para>
</chapter>
```

Attributes

- Convey a characteristic, quality or condition of an element
- Store other (abstract) information that will travel with the doc
- SGML Syntax:

```
<!ATTLIST el_name attr_name values>
```

ATTRIBUTES - the DTD

```
<!ELEMENT chapter (title, para)>
```

```
<!ATTLIST chapter id CDATA>
```

```
<!ELEMENT emph      (#PCDATA)>
```

```
<!ATTLIST emph      type (b|i|u)>
```

Attribute usage - general

GENERIC FORMATTING:

```
<emph type='italic'>
```

DIMENSIONS:

```
<pict height='4.5in' width='3in'>
```

EXTERNAL FILE REFERENCES:

```
<graphic file="c:\pics\grph1.wmf">
```

Attribute usage - abstract

STATUS:

```
<report status='draft'>  
<para security='classified'>  
<sect user_level='advanced'>
```

CROSS-REFERENCES USING UNIQUE IDs:

```
<ref refid='tbl5'> <tbl id='tbl5'>
```

Value of attributes

- Allows more “abstract” information to be stored with your documents
- Focused search & retrieval
- Later formatting or reuse can be dependant upon these attributes

Entities

- Defined unit used to represent something else:
 - special characters
 - string of characters
 - external file reference
- Used in the DTD and in the markup

```
<!ENTITY name "what it represents">
```

Entity

DEFINED IN THE DTD:

```
<!ENTITY sgml "Standard Generalized  
Markup Language">
```

USED IN THE MARKUP:

```
<para>Many industries are adopting  
&sgml; to solve information  
management problems.</para>
```

Entity

DEFINED IN THE DTD:

```
<!ENTITY % paras "para|note|warn">
```

USED IN THE DTD:

```
<!ELEMENT section (title, %paras)>
```

Value of entities

- **Flexibility**

- Ease of replacing items globally
- Can manage entities separately, easier than updating files
- Build from a framework

- **Consistency**

- Always sure a phrase or item is represented properly

So what about HTML??

So what about HTML??



Let's take a look!

How HTML relates to SGML

- Examine HTML DTD
 - Elements/Structure
 - Attributes
 - Entities
- What features are utilized?

Let's Start at the Top...

```
<!ELEMENT HTML 0 0 (%html.content)>
```

```
<!ELEMENT HEAD 0 0 (%head.content)>
```

```
<!ELEMENT BODY 0 0 %body.content>
```

```
<!--===== ENTITIES =====-->
```

```
<!ENTITY % html.content "HEAD, BODY">
```


Continuing with the HTML DTD...

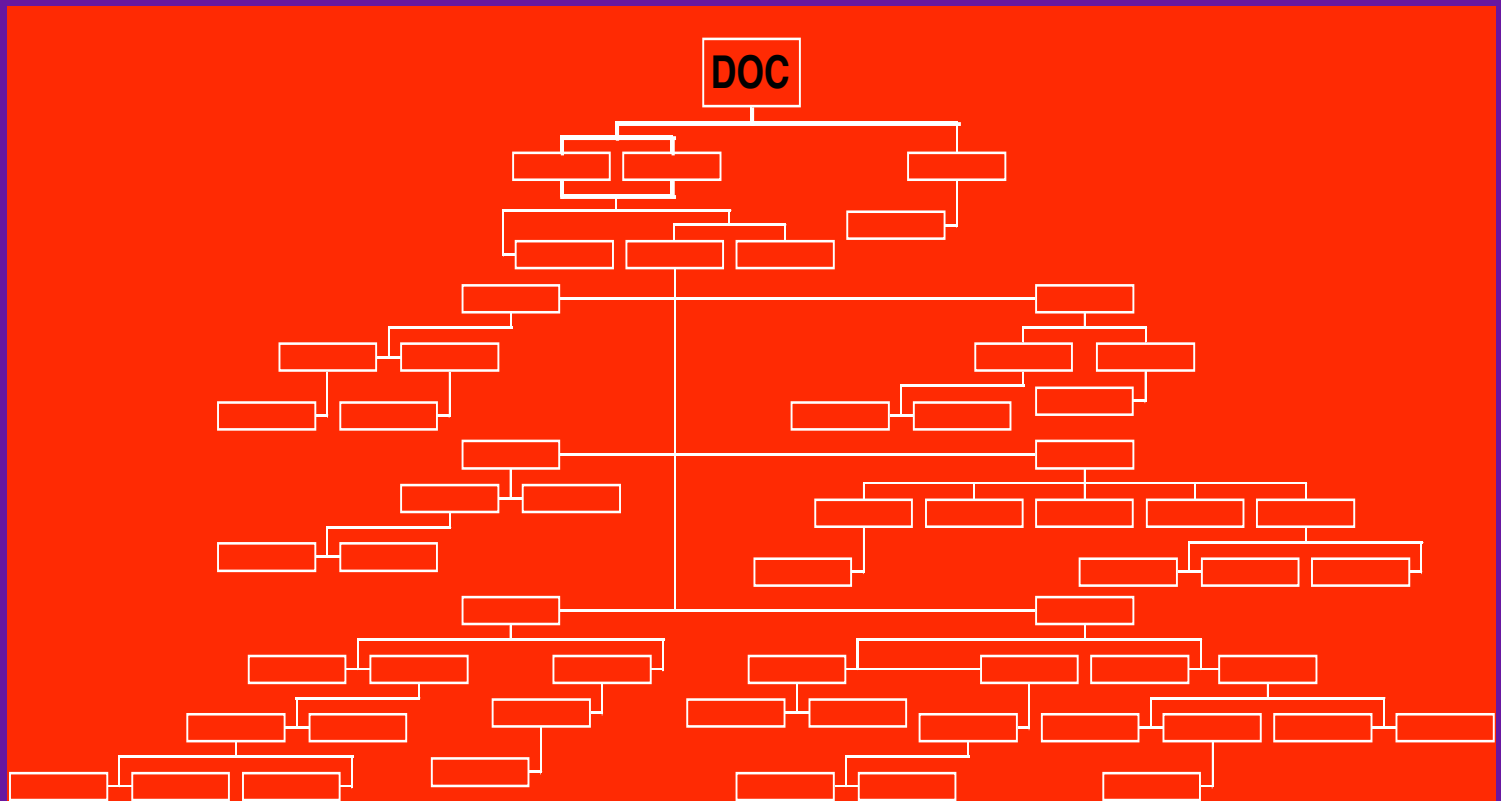
What HTML does do ...

- Cross-reference links
 - “Hot spots” in browsers
- External file references
 - graphics, etc.
- Entities
 - mainly used within the DTD
- Provides a backbone - a commonality between all users

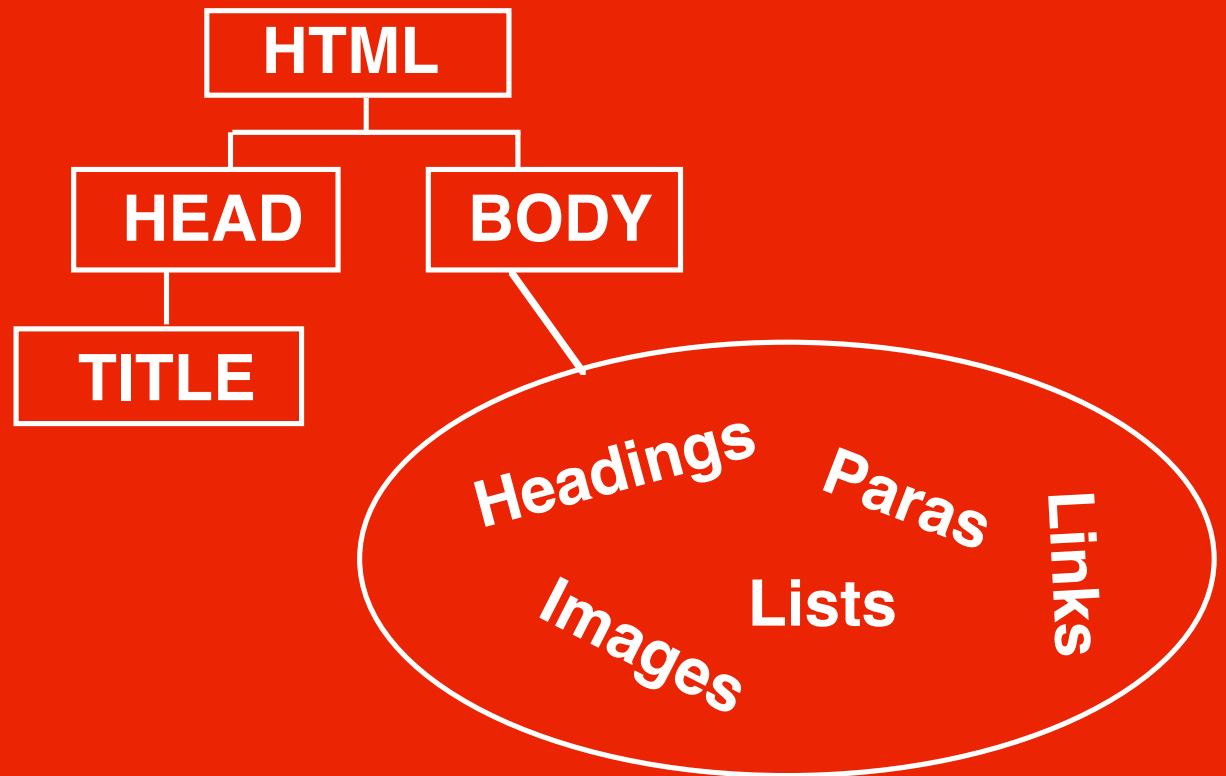
What HTML doesn't utilize ...

- No hierarchy
 - Flat structure
- No enforced structure
 - Anything can go anywhere
- No required elements
 - exception of TITLE
- Little variety of elements
 - exception of headings
- Attributes for “abstract” information

Complex SGML hierarchies



The HTML Hierarchy??



Looking forward

- Why not SGML on the Web?
- How can HTML evolve with SGML?
- Proposed HTML 3 DTD

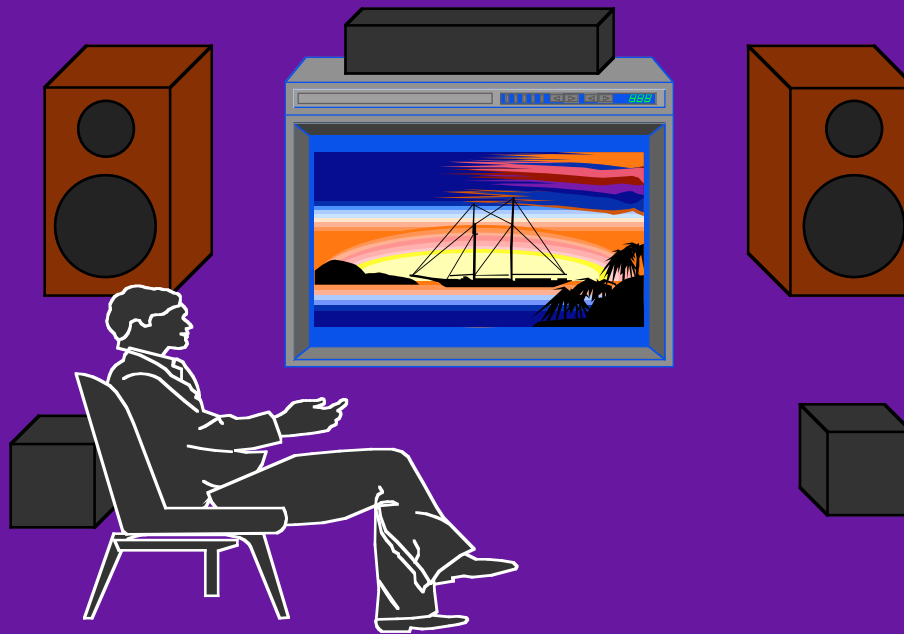
Why not SGML on the Web?

- No common framework
- Must customize for each DTD
- Better approach
 - Use SGML if you need it, and use HTML as one of the published formats
 - Empower HTML with more features to provide a rich distribution environment

Eric's proposal

- Leave HTML as the backbone structure, but utilize more of the power of SGML
- Many features can be optional - only used if you choose to

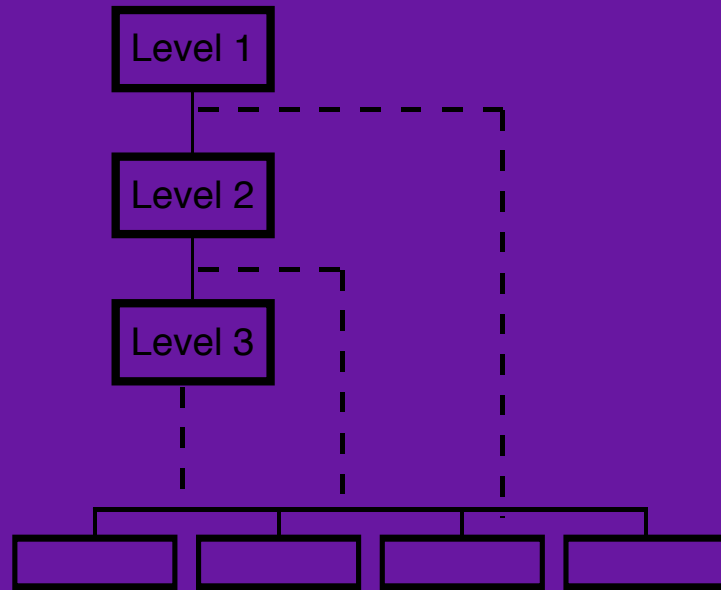
Home Theater vs. Black & White



What would this mean for HTML?

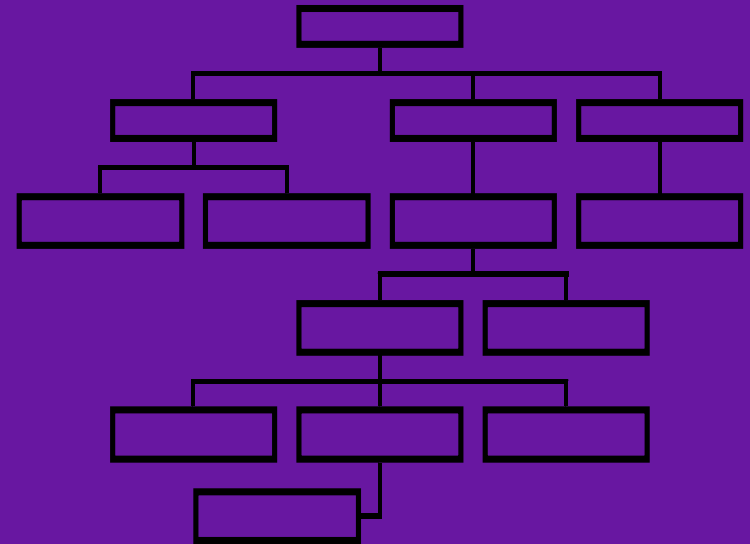
- Provide a reasonable framework for search and linking, but no real structural constraints
- Use few required tags
- Use a simple base tag set, with optional classifications allowed

HTML Structure



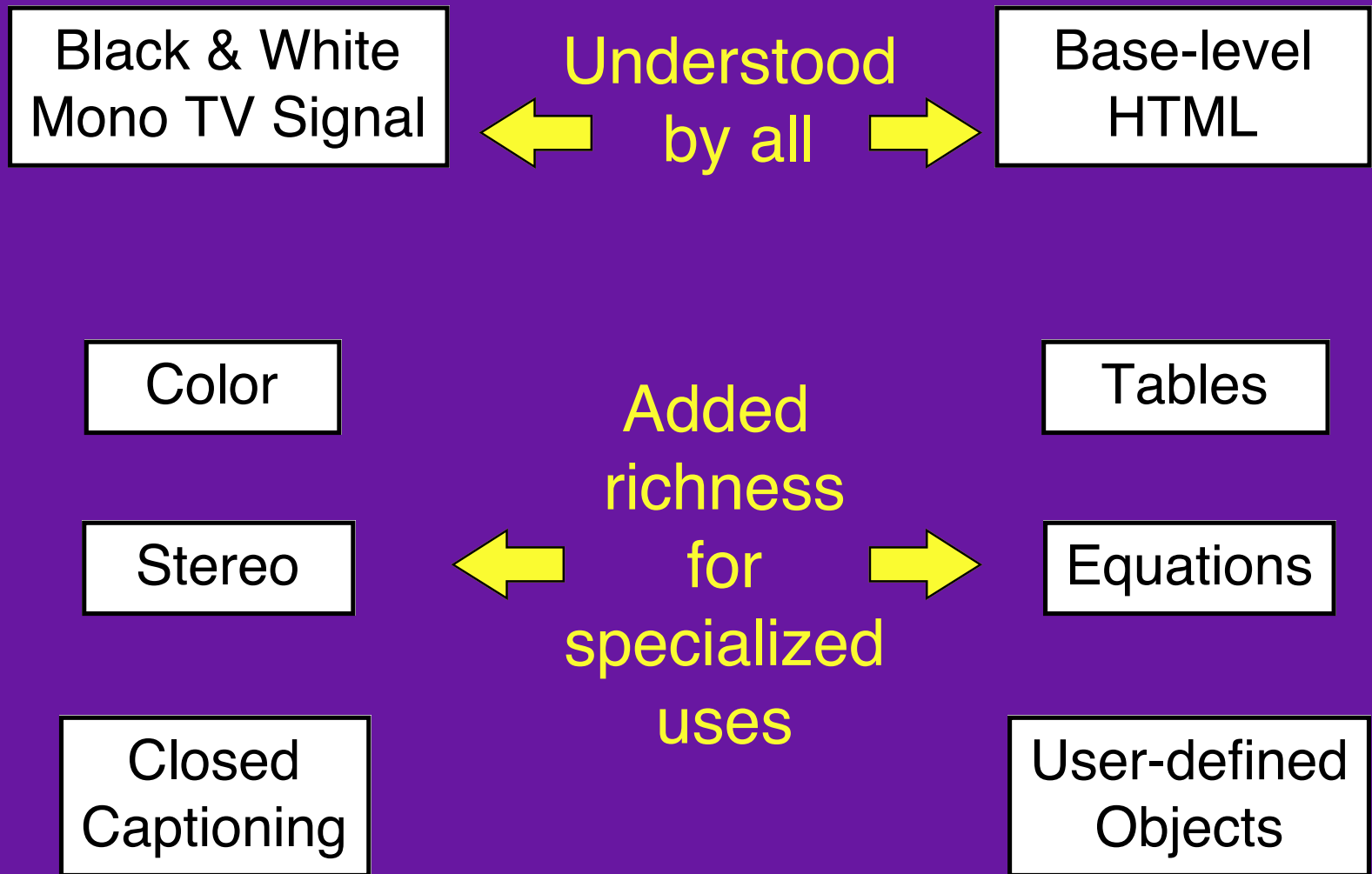
Simple, flexible

VS.



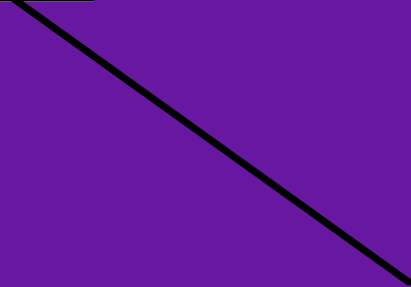
Complex, rigid

Optional layers



Classifying Elements

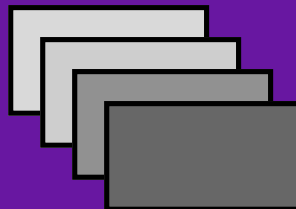
<p class='para'>



Para



Default



Note

Intro

Abstract

Warning



User
Defined

Added
richness
for
specialized
browsers

HTML 3 - new additions

- Documents can be more robust
 - “Class” attribute
 - Tables, math
 - Text flow around figures and tables
 - More element types

Class attribute

- Can be used to “subclass” elements

```
<p class='intro'>  
<p class='abstract'>  
<p class='summary'>  
<p class='preface'>
```

- Optional usage
- Can fit with Eric’s proposal for “scalable” usage

HTML 3 - new additions

- Many “formatting” features
 - “Style” attribute
 - Alignment
 - Banners - permanent headers
 - Needs - space required on page

Proposed formatting features

- Some features are excellent in better handling the complexity of documents
- Things to think about:
 - Do you want formatting to be permanently attached to the information?
 - In some ways are we moving towards a less flexible HTML?

Questions posed earlier ...

“If you have HTML, is there any need for SGML?”

“Is HTML a general interchange format?”

“Could HTML be the form in which I store my documents?”

The Answers ...

...lie in some additional questions to you:

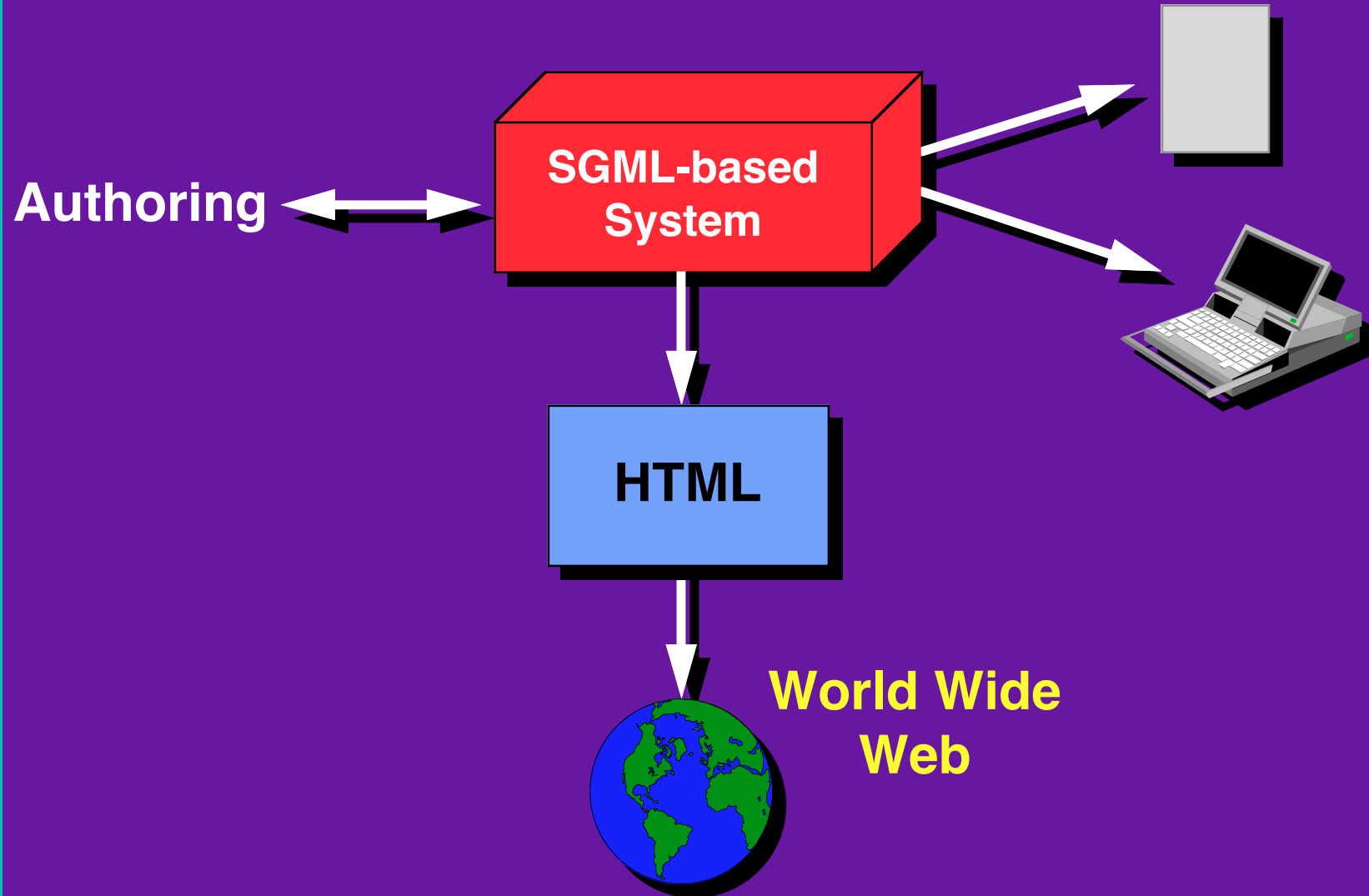
**What do you need or plan to do
with your information?**

**Could you benefit from the
additional features available to
you with SGML?**

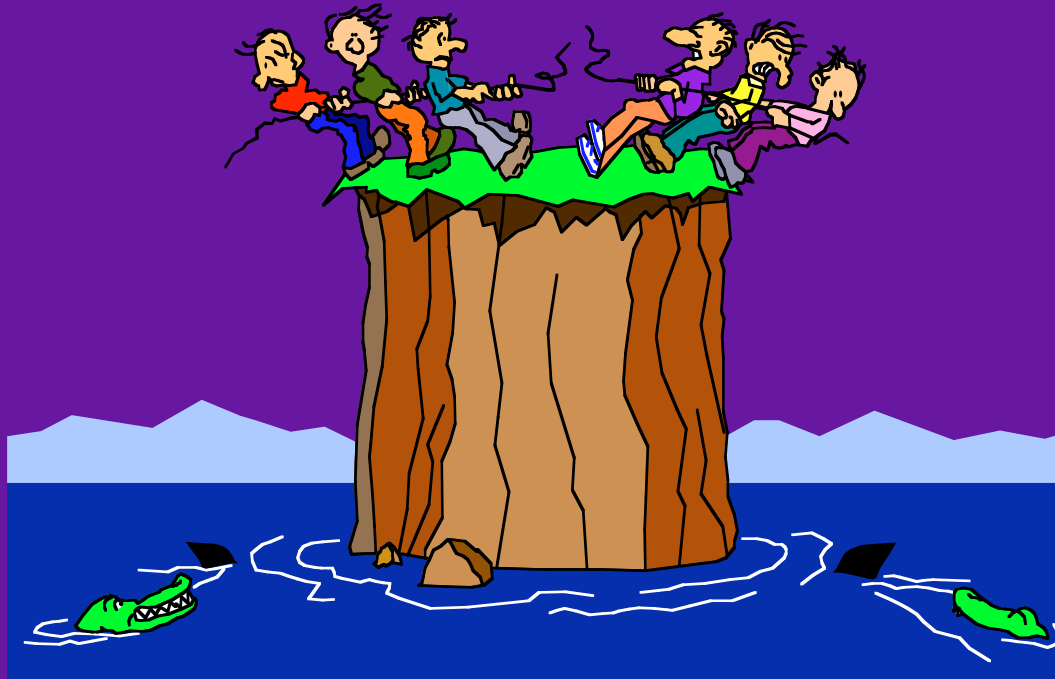
In Summary

- Many are finding themselves caught by the limitations of HTML
 - but HTML was designed to be SIMPLE
- HTML is continuously evolving, and could take advantage of more of the power of SGML
- SGML is always an option as a part of your solution

Consider SGML at the center

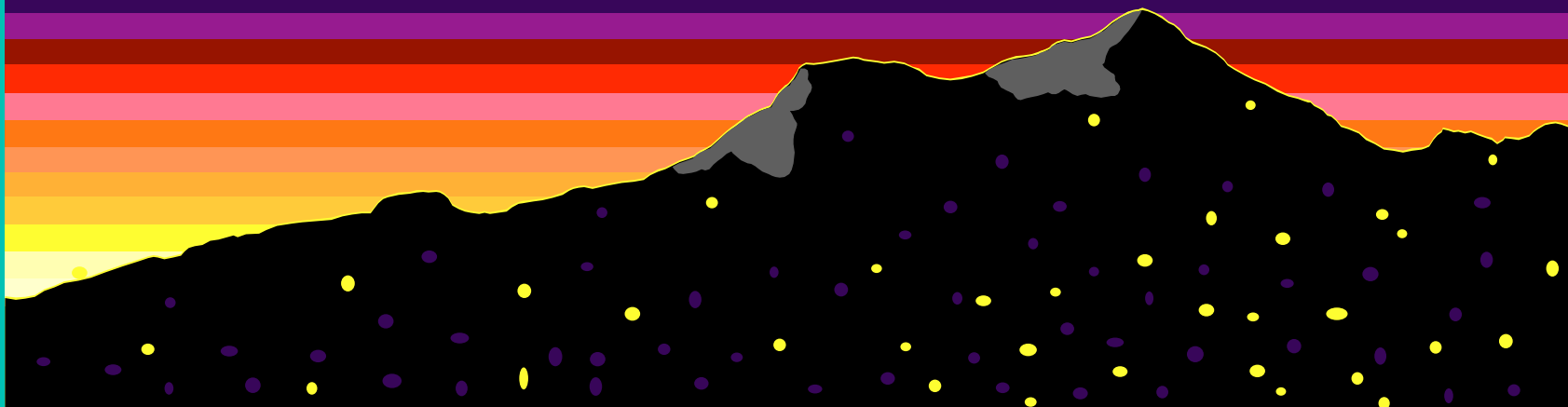


Remember... It's NOT a Battle



SGML and HTML do work well together

- SGML provides us with many powerful features
- HTML is just barely tapping into those possibilities
- Possible to have simplicity AND power



To find out more ...

Interleaf offers SGML training courses:

For more information, CALL:

(800) 685 - 5323

End of Presentation

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Marketing Rules of Server Design

Jim Sterne



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Jim Sterne

Web marketing strategy consultant

Co-founder Internet access provider

15 years technical sales & marketing

“Marketing on the Internet” seminars

Author “World Wide Web Marketing”

Marketing Rules of Server Design

- 1. Make it Fun, Useful or Interesting**
- 2. Make it Easy**
- 3. Make it Fresh**
- 4. Make it Targeted**
- 5. Make it a Two Way Street**
- 6. Make it Personal**

Fun / Useful / Interesting

**To get their attention
It's just good marketing
It's in keeping with the culture**

The Internet Frontier

Sparsely populated territory

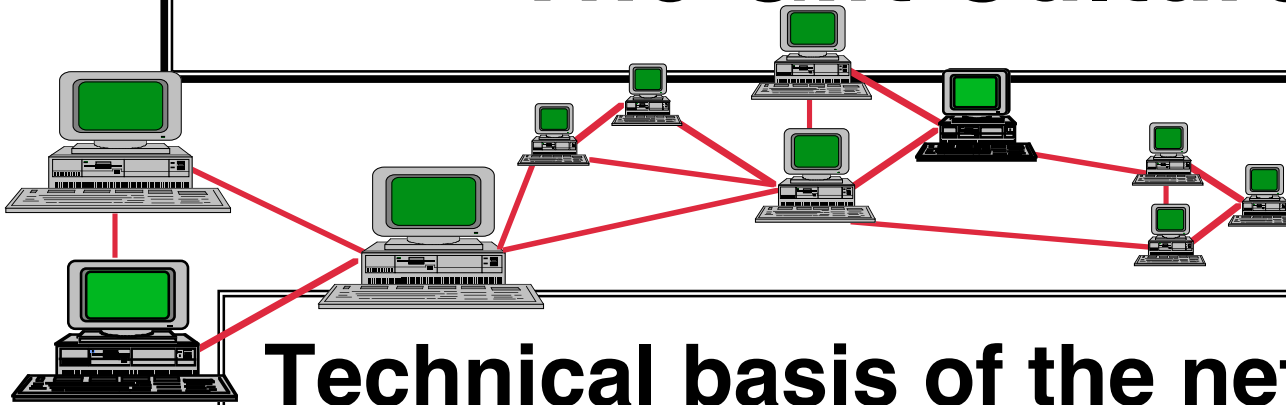
Common enemies

Common goals

Code of honor



The Gift Culture



Technical basis of the network
Community spirited
Enlightened self interest



Fun / Useful / Interesting

Fun -

funny

challenging

entertaining



Fun / Useful / Interesting

Interesting / Useful

newsworthy

idea exchange

customer service

reference storehouse

Make it Easy

Easy to Find

Easy to Read

Easy to Navigate

Make it Easy to Find

Announce far & Wide

Buy links

Use traditional marketing

Outsourcing Announcements

<http://www.netcreations.com/postmaster>

<http://submit-it.permalink.com/submit-it>

Eric Ward netpost@netpost.com

Make it Easy to Read

Desktop publishing pitfall

Silly copy pitfall

Wired pitfall

Enhanced for Netscape

Make it Easy to Navigate

Don't lose them within your site

provide easy choices & quick access

provide a map (visual clues)

provide directional signals

provide a search tool

Marketing Rules of Server Design

1. Make it Fun, Useful or Interesting
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6. Make it Personal

Revise Your Web Site First

Latest & greatest expected
Schedule updates by calendar
Press releases / events / news

Tie In All Other Activities

Special events

Special discounts

Seminars

Trade shows

Make it Targeted

What is the purpose?

Who is it for?

Enhanced it for Netscape?

What is the Purpose?

**What are you really trying
to accomplish?**

Corporate image

Customer service

Brand awareness

Prospect qualification

Product sales

Who is It For?

Corporate image	-	Press & Analysts
Customer service	-	Customers & Prospects
Brand awareness	-	General Public
Prospect qualification	-	Prospects Only
Product sales	-	Customers & Prospects

How Are They Configured?

14.4 Modem?

Daily Dial-In?

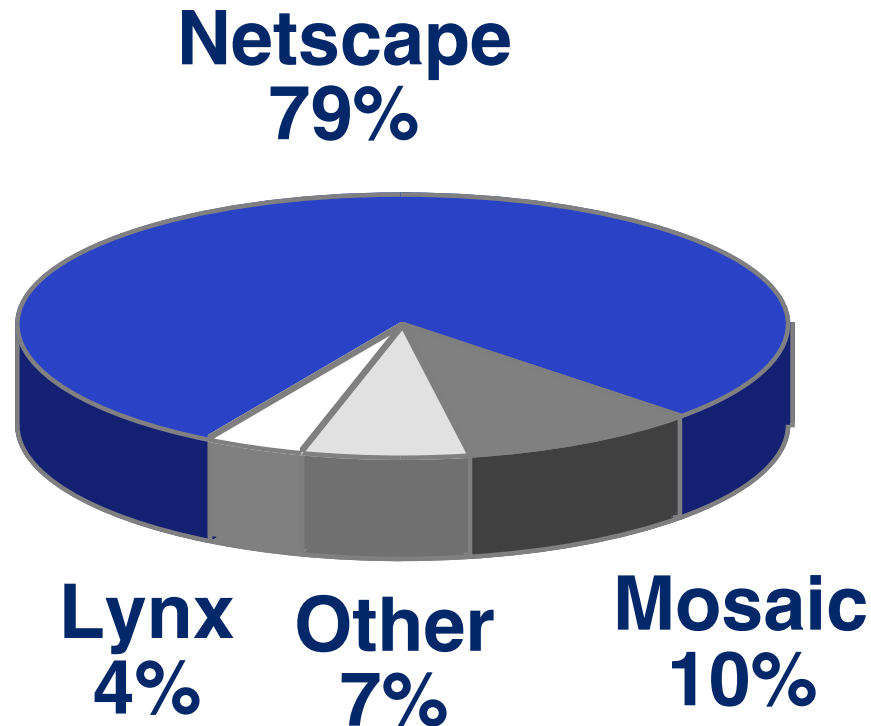
Super VGA?

America OnLine?

Enhanced for Netscape?

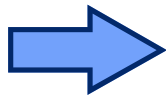
Netscape Market Dominance

Browsers used to select the Random Site link at Yahoo! in Sept 95

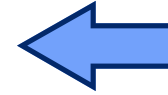


Make it Targeted

**Self-Selection is the
Name of the Game**



Let them target themselves



Marketing Rules of Server Design

1. Make it Fun, Useful or Interesting
2. Make it Easy
3. Make it Fresh
4. Make it Targeted
5. Make it a Two Way Street
6. Make it Personal

Make it a Two-Way Street

Make them “pay” for your info

Ask for their opinion

about your products

about your competition

about your Web site

Marketing Rules of Server Design

1. Make it Fun, Useful or Interesting
2. Make it Easy
3. Make it Fresh
4. Make it Targeted
5. Make it a Two Way Street
6. Make it Personal

Make it Personal

Good to see you again, Dave
Since you were here last:

We've added some new features

We got a new shipment of your favorites

Your investment portfolio has improved

We're still backordered on those golf clubs

We have a new version of your software

Marketing Rules of Server Design

- 1. Make it Fun, Useful or Interesting**
- 2. Make it Easy**
- 3. Make it Fresh**
- 4. Make it Targeted**
- 5. Make it a Two Way Street**
- 6. Make it Personal**

Predicting the Future

**“By the year 2000 there will be
one billion on the Internet”**

Nicolas Negroponte

Predicting the Future

Short term

E-mail & Web will be expected

All services combined

More VRML & Hot Java

Web access will be embedded

Long term science fiction

Combined Services

E-mail

File transfer

Web access

Audio

Video

Embedded Access

**Browsers will disappear
Help & clip art examples
Where do you add value?**

Why Not Just Wait?

No standards

The technology is changing so fast

Interactive TV is coming

My customers aren't there yet

Start Now to Learn a New Way of Communicating

Requires new procedures

Requires new skills

Requires new assignments

Requires new mindset

Opening the Corporation

Customer access to data

Customer access to policy

Customer access to plans

Customer access to data

Good to see you again, Dave
Since you were here last:

We've added some new features

We got a new shipment of your favorites

Your investment portfolio has improved

We're still backordered on those golf clubs

We have a new version of your software

Customer access to policy

Why thirty minutes on hold?

Why not split a single order?

Why no custom color unless > 500 ?

Why 4 - 6 weeks for delivery?

Customer access to plans

Product feature voting

Product schedule bidding

Personnel evaluation reporting

Customers As Stockholders

Predicting the Future

Short term

E-mail & Web will be expected

All services combined

More VRML & Hot Java

Web access will be embedded

Long term science fiction

Predicting the Future

“By the year 2055 everything that can be connected will be connected”

Jim Sterne

Marketing Rules of Server Design

Thank You



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Doomed To Failure: Unsuccessful Web Sites



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Author “World Wide Web Marketing”**

Web Sites That Are Doomed to Failure:

- 1. Set unrealistic (or no) goals**
- 2. Refuse to plan**
- 3. Underutilize the technology**
- 4. Insufficiently promote**
- 5. Focus on the company -
not the customer**

Unrealistic Goals / Expectations

Broadcast to millions

Discover an untapped market

Stop other forms of marketing

Sell automagically

MAKE MONEY FAST

The Internet Is NOT:

A replacement for marketing

A stand-alone medium

Full of rubes ripe for the fleecing

Realistic Goals / Expectations

Sharpen corporate image
Improve customer service
Heighten brand awareness
Qualify prospects
Sell (some) product
Open an electronic dialog

Web Sites That Are Doomed to Failure:

- 1. Set unrealistic (or no) goals**
- 2. Refuse to plan**
- 3. Underutilize the technology**
- 4. Insufficiently promote**
- 5. Focus on the company -
not the customer**

No Plans

“Under Construction”

“Coming Soon”

“Come Back and Check”

The Front End

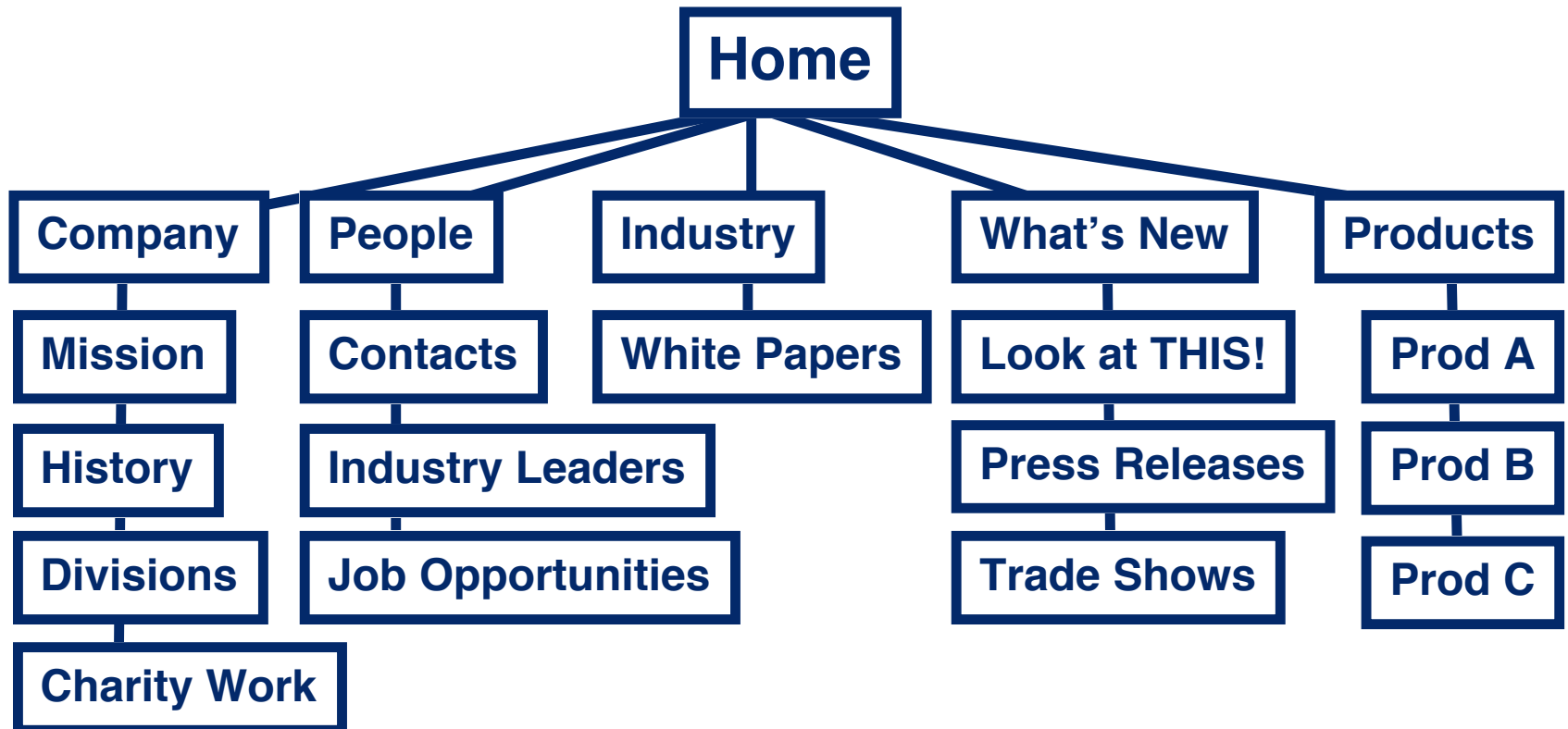
Thoughtful graphics

Excellent copy

Professional layout

Detailed site map

Web Site Map



The Back End

Flowchart

Database design

Ties to corp systems

Resources and Budget

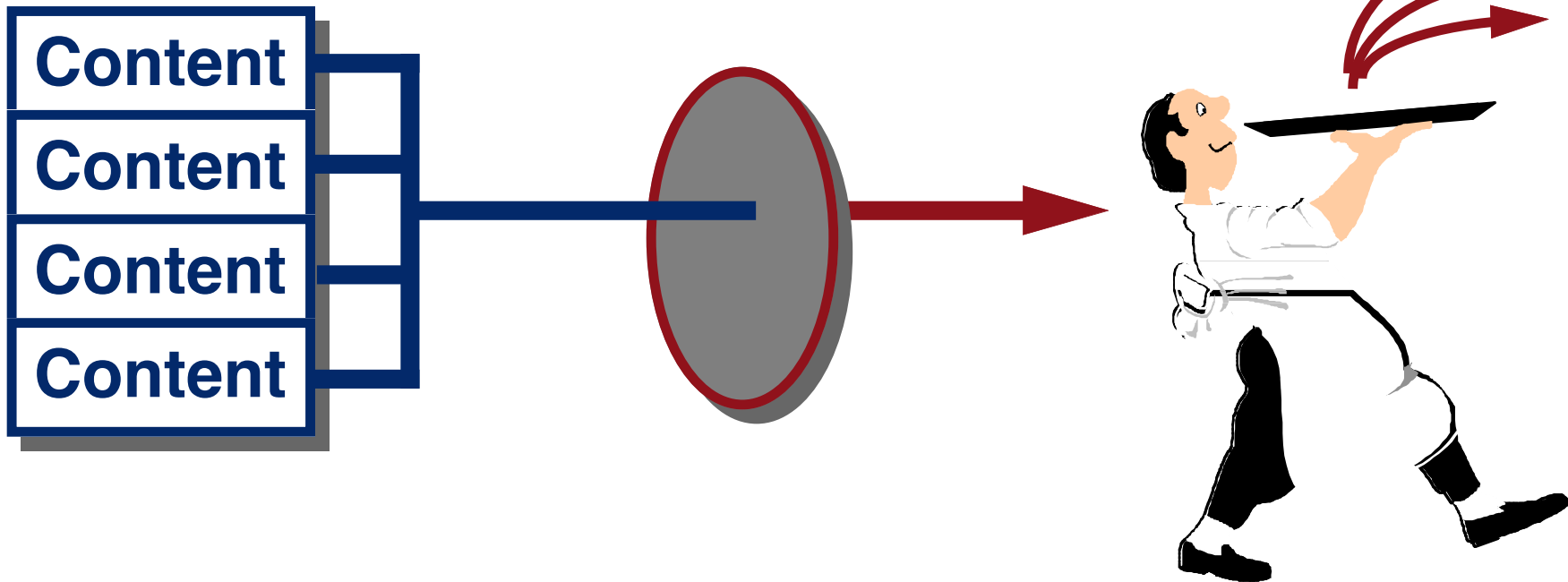
Access
Hardware
Software
People

The People

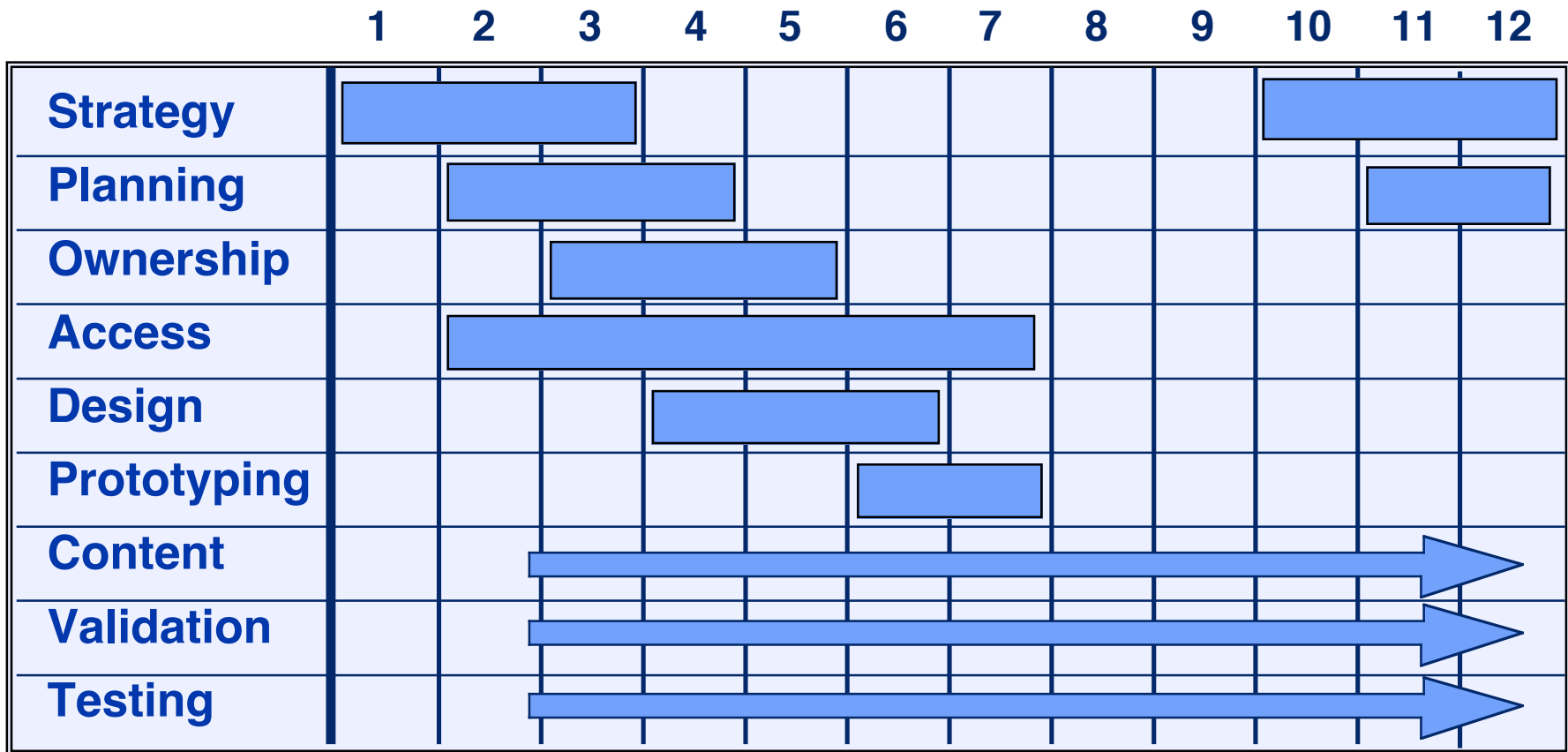
Marketing

Corp Comm

Technical



The Time Line in Weeks



Web Sites That Are Doomed to Failure:

- 1. Set unrealistic (or no) goals**
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Web Sites That Are Doomed to Failure:

- 1. Set unrealistic (or no) goals**
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- 4. Insufficiently promote**
- 5. Focus on the company -
not the customer**

Getting the Word Out

On-topic and “Announce”

Buy-a-Link

Your signature

Keywords

Traditional marketing

Post With Care

Fetch the INTRO message

Read the FAQ

Lurk / review for a week

Getting the Word Out

On-topic and “Announce”

Buy-a-Link

Your signature

Keywords

Traditional marketing

Buy-a-Link

Per Month

Netscape	\$14,000
Hot Wired	\$15,000
Prodigy	\$16,000
NCSA Whats New	\$30,000

Getting the Word Out

On-topic and “Announce”

Buy-a-Link

Your signature

Keywords

Traditional marketing

Traditional Marketing

PR value

800 number effect

Be the reason

Web Sites That Are Doomed to Failure:

1. Set unrealistic (or no) goals
2. Refuse to plan
3. Underutilize the technology
4. Insufficiently promote
5. **Focus on the company -
not the customer**

The Company Web Site Doomed to Failure:

**Wow! Look! We're on the Web !
Here's our mission statement !
Here's stuff about our history !
Here's stuff about our CEO !!!
Here's stuff about our financials
Oh, and here's our product catalog**

The Internet is Opening the Corporation

Customer access to data

Customer access to policy

Customer impact on products

Focus on

**Customer Service
Customer Interaction
Customer Experience**

Or be:

Doomed To Failure: Unsuccessful Web Sites



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Internet 2010 - A View of the Future

Jay M. Tenenbaum
Enterprise Integration Technologies

October 1995

Societal Impact

“...ahead of the telephone and television, but behind the printing press and the motor car”

- The Economist, July 1995

Internet 2010

- **The net**

- Data dialtone

- Wireless or fiber - ubiquitous access

- Information appliances

- PCs, telephones, PDAs, TVs

- Network-aware applications and agents

- Immersive environments

- **Internet legacy**

- Flat pricing

- Openness

Societal Impact

• Freedom and Empowerment

Explosion of choices

- Where people live and work

- What they can buy

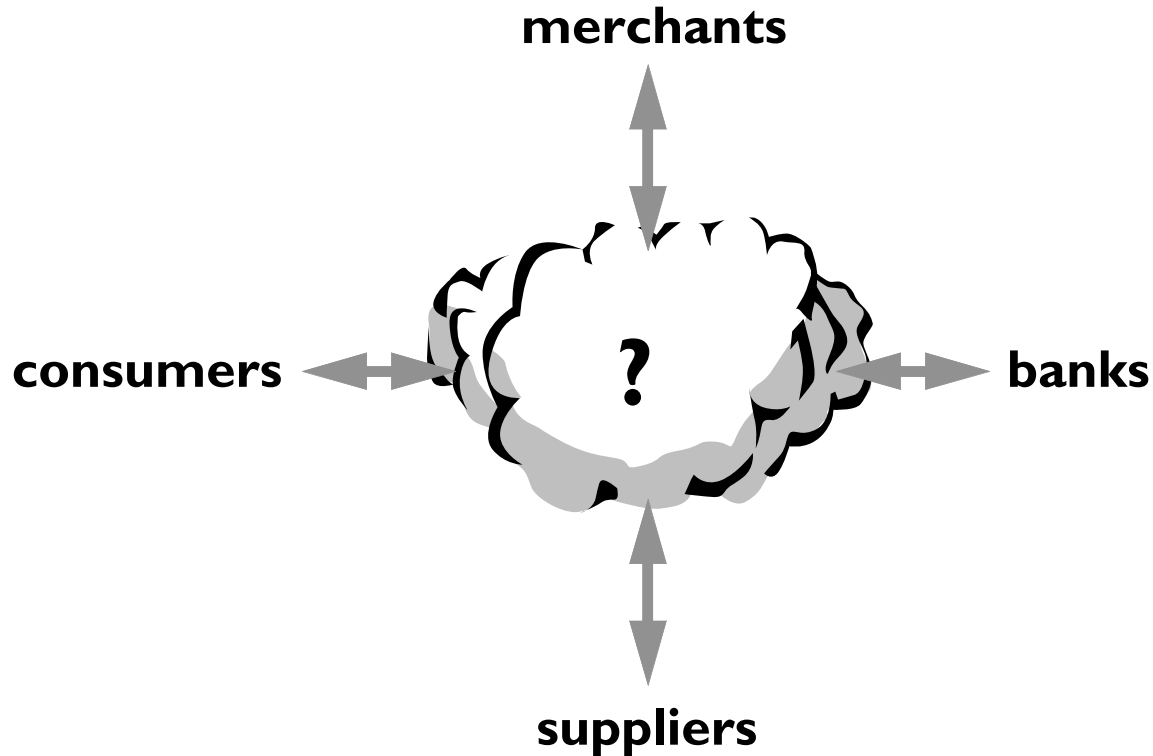
- Access to information needed to make comparisons and informed decisions

Every home a broadcast studio,
teleconferencing center, and global merchant

Bypass gatekeepers

Cross borders

Commerce



crisis = danger + opportunity

The Case For Internet Commerce

- **For Businesses**

- Sell globally

- Slash distribution costs

- Improve service

- **For Consumers**

- Unprecedented choices = wide selection, low prices

- Information to make informed decisions

- Convenience

Manufacturing - Implications

- **Mass customization**
- **Reuse of design concepts**
- **Virtual enterprises**
- **Supply-chain integration**

Higher Education

- **Universities in crisis**

- **Drivers**

Economics

Knowledge explosion

Interdisciplinary studies

Lifelong learning

Information technology

The Virtual University

- **A distributed community of scholars, students, and administrators**
- **A vast array of online resources and services**

Student services

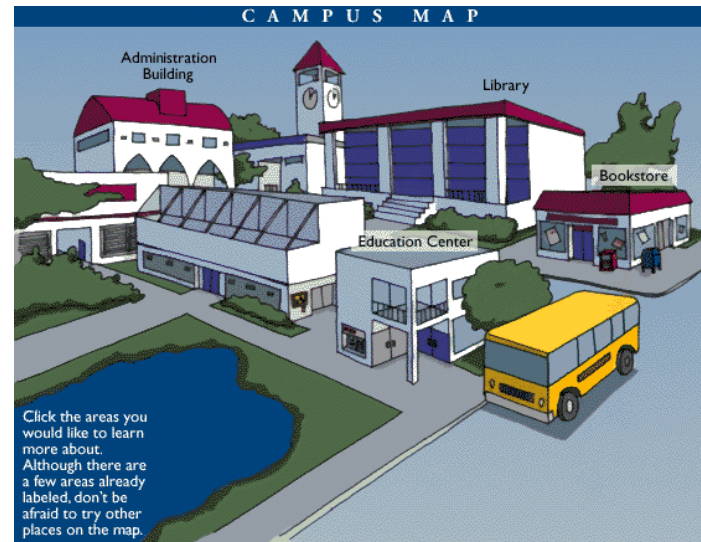
Academic publishing

Libraries

Teaching

Research

Administration



Health Care

- **A virtual community**

Consumers

Doctors

Dentists

Specialists

Nurses

Administrators

Social Workers

Hospitals

HMOs

Laboratories

Pharmacies

Medical Libraries and
Information Services

Medical and Hospital
Suppliers

Insurers

Health Care

- **Online resources and services**

- Patient data records

- Medical information and expertise

- Collaboration/telemedicine

- Procurement services/catalogs

- Laboratory equipment

- **New roles for lawyers**

- Information providers

- Legal briefs and opinions

- Forms

- Courses

- Value-added services

- Referrals

- Indexing and organizing

- Online consulting and legal opinions

Publishing

- **Today's print-based information marketplace**

Content: writers, musicians, artists

Publishers: editing, layout, printing, promotion, distribution

Distribution: retailers, libraries, distributors, resellers

Value-added services: research, search, data analysis, reviews, copyright and royalty collection...

Publishing

- **The emerging online marketplace**

- Content creation

- Net-aware authoring and collaboration

- Publishing services

- Editors, illustrators, translators, print-on-demand, sales

- Information intermediaries

- Find, filter, personalize, aggregate, integrate, annotate, guide, consult, review, alert

- Library services

- Select, index, store, research

Publishing-Implications

- **New business models**
- **New authors - everyone**
- **New intermediaries**

Broadcasting = Narrowcasting

- **Five billion channels**
- **Every home a broadcast studio**
- **Every viewer a performer**



Societal Impact

“...ahead of the telephone and television, but behind the printing press and the motor car”

- The Economist, July 1995

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Hot New Technologies at the Fall Internet World 95
<http://www.tiac.net/users/hope/iw95.html>

Jane Dysart, Dysart & Associates
Walt Howe, Delphi Internet Associates
<http://www.delphi.com/walthowe/>
Hope Tillman, Babson College
<http://www.tiac.net/users/hope/>

Jane Dysart, Walt Howe, and Hope Tillman have selected a representative sample of innovative products from among a vast array of possible choices. Hundreds of exhibitors in over 60,000 square feet of exhibit space have showcased the most innovative products and services of today in the Internet World Exhibit Hall. The three selectors make no claim that the products selected are the best of their type but that they are a representative sample of current important trends in the Internet World. This session is designed to "package" some of the information being delivered on the exhibit floor and present it in a convenient method as a panel session.

Enabling Commerce/Tracking — CommerceNet

<http://www.commerce.net/>
William T. Wong, Enterprise Integration Technologies (VeriFone)
"CommerceNet is a non-profit consortium of organizations whose charter is to accelerate the use of the Internet for electronic commerce."

Security First Network Bank, FSB

<http://www.sfnb.com/>
"The first full-service Internet-based bank, Security First Network Bank, FSB was the first bank to license Virtual Bank Manager, which is built upon a sophisticated security architecture. Security First believes that this architecture provides, for the first time, a workable and critical element for processing secure transactions on the Internet. Security First expects to offer a full range of depositor banking services over the Internet, including mutual funds, brokerage accounts and more."

InfoMarket

<http://www.infomkt.ibm.com/>
John P. McIlraith, Strategic Alliance Manager, InfoMarket
"infoMarket allows digital publishers to plug-n-publish safely on the Internet with Cryptolopes. By using cryptolopes to transmit information, infoMarket Search solves two problems at once--protection of intellectual property and compensating authors for work that is distributed digitally."

NetCount

<http://www.netcount.com/>
Paul Grand, Chairman of the Board
"NetCount's tracking system provides detailed analysis and reporting of

website usage. Through NetCount(TM), website creators and advertisers will at last be able to make use of a universally recognized ratings system (comparable to the Nielsens) that provides precise traffic information, broken down by website, subject, page, day and hour."

Filtering — Individual, Inc.

<http://www.newspage.com/>

Russell Williams, Vice President, New Internet Ventures

"Individual's customized news products are created by an interactive, self-learning software agent (expert system) that searches a broad spectrum of electronic newswires, newspapers, and trade magazines to find the articles uniquely relevant to each client."

Eudora (Qualcomm, Inc.)

<http://www.qualcomm.com/ProdTech/quest/QuestMain.html>

Roy Ang

"Eudora saves you time in composing, managing, and responding to your e-mail separating the hot mail from the junk mail with customizable filters, and enabling you to organize your mail by personal categories."

Platform for Internet Content Selection (PICS)

<http://www.w3.org/pub/WWW/PICS/>

Rob Glaser, President CEO, Progressive Networks

"PICS is a cross-industry working group whose goal is to facilitate the development of technologies to give users of interactive media, such as the Internet, control over the kinds of material to which they and their children have access. PICS members believe that individuals, groups and businesses should have easy access to the widest possible range of content selection products, and a diversity of voluntary rating systems."

See the W3C press advisory on PICS:

http://www.w3.org/pub/WWW/PICS/951030/951030_Advisory.html

Some of the Next Generation Tools

Netscape

http://home.netscape.com/comprod/products/navigator/version_2.0/

"Netscape Navigator 2.0 is a major new release of the world's most popular Internet navigator, bringing Web exploring, email, newsgroups, chat, and FTP capabilities together in a seamlessly integrated package. It supports Live Objects and other interactive multimedia content such as Java Applets, frames, and Netscape inline plug-ins. Netscape Navigator Gold 2.0 provides all the capabilities of Netscape Navigator 2.0 plus integrated WYSIWYG document creation and publishing capabilities."

Microsoft Corporation

<http://www.microsoft.com/windows/ie/iexplorer.htm>

"To provide superior integration with today's Web pages, Internet Explorer

2.0 includes support for HTML 3.0 tables; access to Internet newsgroups; a toolbar button for instant access to the world's most powerful Web search engines; the ability to run animations using client-pull technology, and a secure environment. The addition of special Internet tokens, called "cookies," enables Web surfers to shop at their favorite Internet outlets."

Sun Microsystems

<http://java.sun.com/>

"Java (tm) is a simple, object-oriented, distributed, interpreted, robust, secure, architecture-neutral, portable, high-performance, multithreaded, dynamic, buzzword-compliant, general-purpose programming language. Java supports programming for the Internet in the form of platform-independent Java applets."

InterNotes

<http://www.lotus.com/corpcomm/334a.htm>

Angela Finney, Senior Marketing Specialist

InterNotes Web Publisher 2.0 publishes Notes documents and forms to the Web by automatically translating them into HTML. It provides full text searching returned as web links.

Web Authoring Tools

Adobe Systems (PageMill)

<http://www.adobe.com/Apps/PageMill/>

InContext Corporation

<http://www.incontext.com/>

InfoAccess (HTML Transmit)

<http://www.infoaccess.com/product/htmlpre.htm#I>

Quarterdeck Corporation (Web Author)

<http://www.qdeck.com/qdeck/demosoft/WebAuthr/>

SoftQuad (Hot Metal)

<http://www.sq.com/>

Vermeer Technologies, Inc. (FrontPage)

<http://www.vermeer.com/>

Responding to the major interest in individual web sites, exhibitors demonstrated a number of new or improved Internet web authoring tools. Each has its own strengths and features and seeks to carve out a significant share of the market.

Concluding Thoughts

Along with all the new products, there were signs of problems typical of a fast emerging technology. Standardization, necessary for compatibility across systems, requires a slow deliberative process, and the freely given participation of all concerned segments of the development community. On the other hand, the pressures of the marketplace compel competitive businesses to be the first with the newest technology, and standardization can take a back seat to "progress."

A similar problem with forces in opposition is the need to make interfaces to the Internet and web technology as easy as possible for the large numbers of new customers coming into the market, while at the same time introducing new and better capabilities. It takes just as much attention to the human factors as to the technology itself, and those who do it best can gain a great deal.

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Transaction Options

Open Market's “Commerce Architecture”

Cliff Utstein

Open Market Inc. (Booth #456)

Director, Commerce Products

Email: utstein@openmarket.com

Tel: 617-374-3768

Open Market Corporate Overview

- Founded April, '94 by David Gifford and Shikhar Ghosh
- Based in Cambridge, MA
- Satellite development center in Palo Alto, CA
- ~165 Employees
- Privately Financed
 - Greylock Venture Capital
 - Advance Publications
 - Time Warner
 - Tribune Company

Open Market Customers and Partners

Publishing

- **Time Inc.**
- **Tribune Company**
- **Advance Publications**
 - **Condé Nast**
 - **Random House**
- **Ziff Davis**
- **Lexis-Nexis**
- **Copyright Clearance Center**

Financial Services

- **Banc One**
- **First Union National Bank**
- **American Express**
- **Toronto Dominion**
- **FDC/Envoy**
- **Litle & Co.**
- **Checkfree**

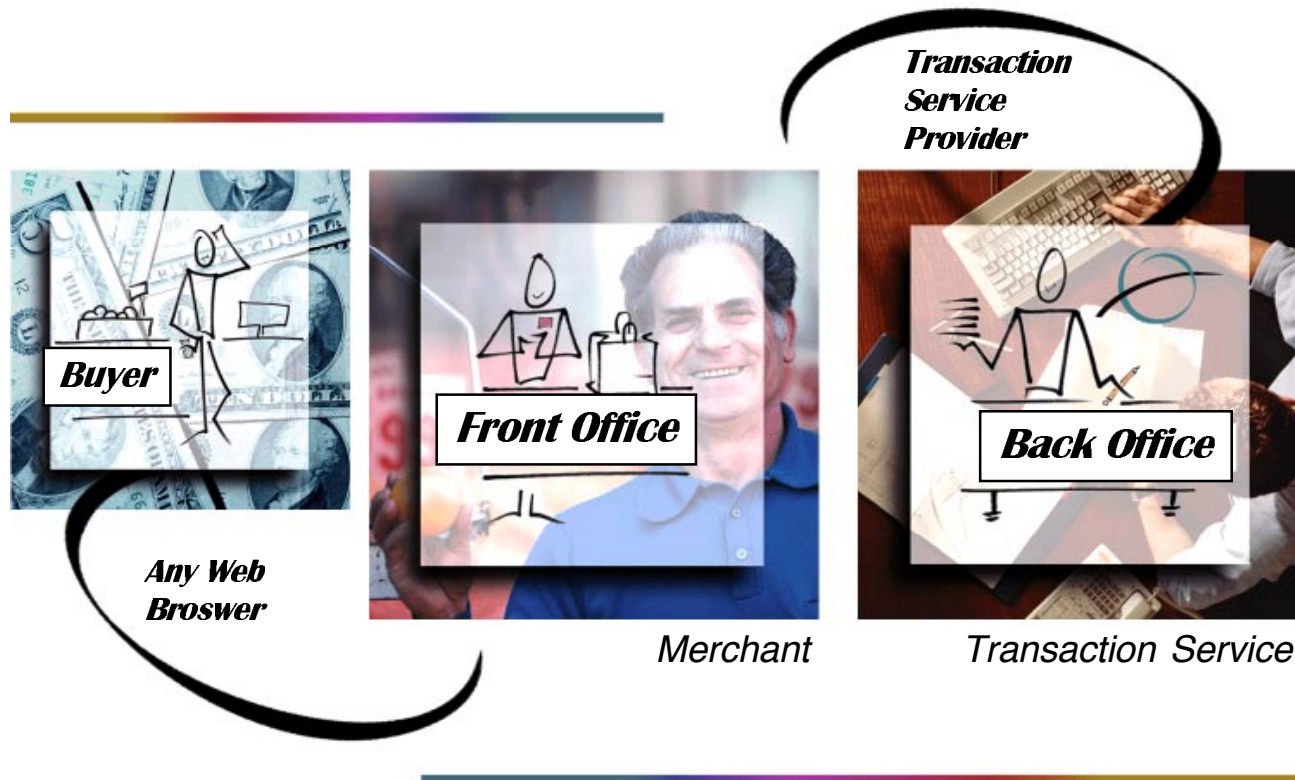
Others

- **IBM**
- **FTP Software**
- **Tandem Computers**
- **Digital Equipment Corp**
- **CyberCash**
- **Verity**
- **Personal Library SW**

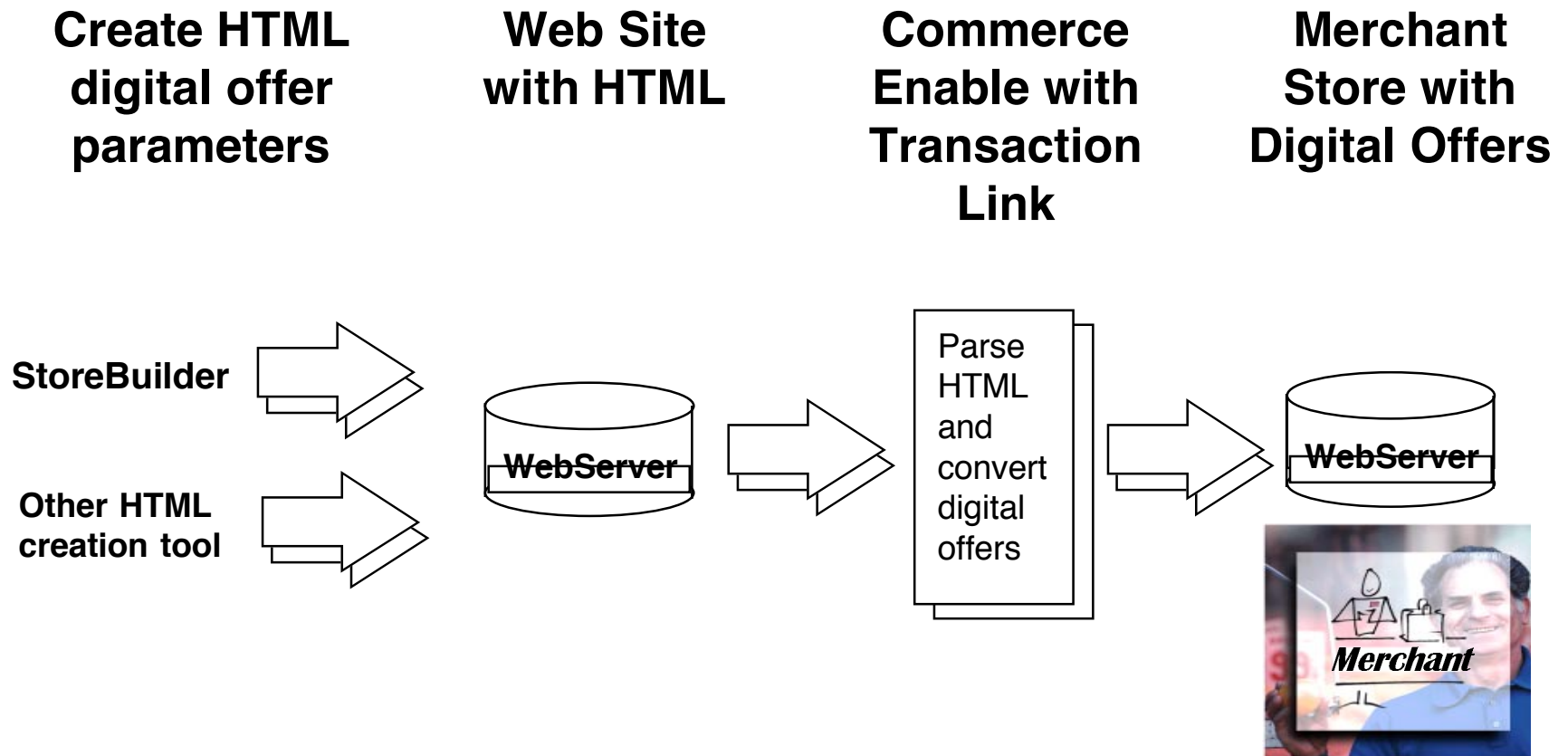
7 Requirements for Highly Effective Internet Commerce

1. Provide security for a business environment
2. Generate compelling content that attracts traffic
3. Allow on-line, order taking and payment processing
4. Fulfill both soft and hard goods
5. Facilitate customer service
6. Build customer relationships and generate reports
7. Integrate existing business systems

Open Market Commerce Architecture



How to Create a Store with Digital Offers



Commerce Architecture: Overview

- Merchants focus on their business (the *Front Office*), while the Transaction Service Provider manages the *Back Office*
- “Commerce-enable” a Web site in just a few hours
- Incorporate new *Back Office* features without additional software
- Utilize widely deployed, open, standards-based technology
- Easily scales as your business grows on the Web
- Online credit card payment and softgood fulfillment
- First product availability November 1995

Components

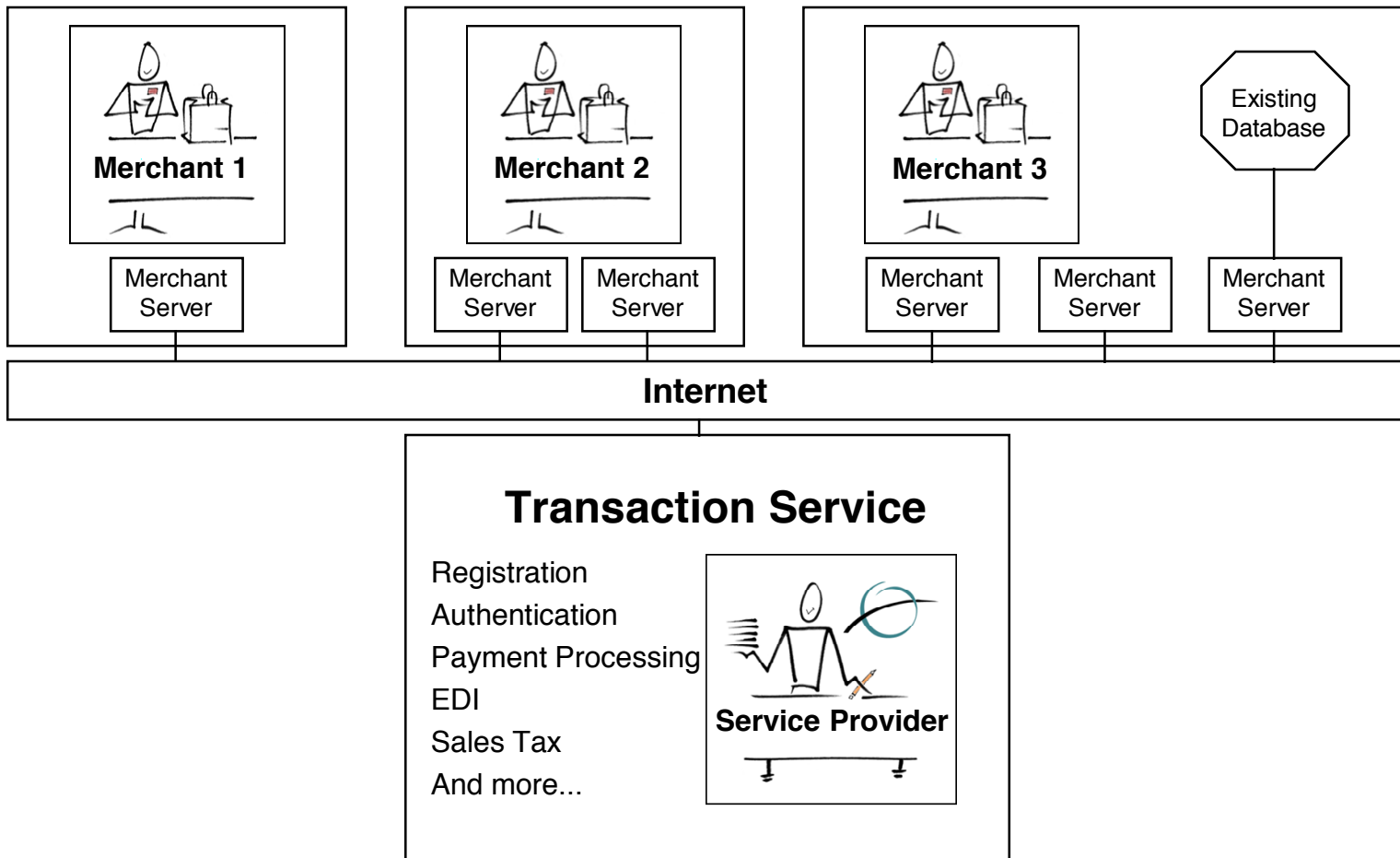
- Front Office Software Components:
 - Web server: **Secure WebServer™**
 - HTML Authoring: **StoreBuilder™**
 - Commerce Enable: **Transaction Link™**
 - Reporting: **WebReporter™**
- Back Office: **Transaction Service Provider**

“Back Office” Highlights

- Customer service automation with “SmartStatements”
- Order-taking, and credit card authorization/settlement
- Automated U.S. and Canadian sales tax calculation
- Digital Receipt generation
- Automated computation of shipping fees
- Account-based purchases with no Internet transmission of credit card information
- “Walk-in” purchases using a secure browser
- Customer customer shopping carts

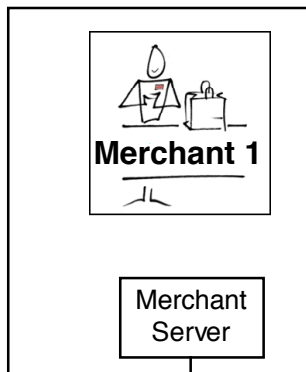
Note: As new features are offered on the ICS, they're automatically available to merchants (e.g..., Cybercash payment)

Open Market's Commerce Architecture Links Distributed Content to Shared, Common Services...

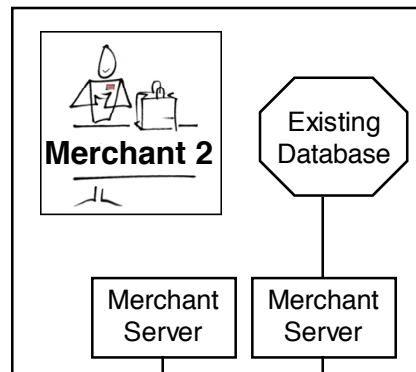


...And Provides a Scalable Solution

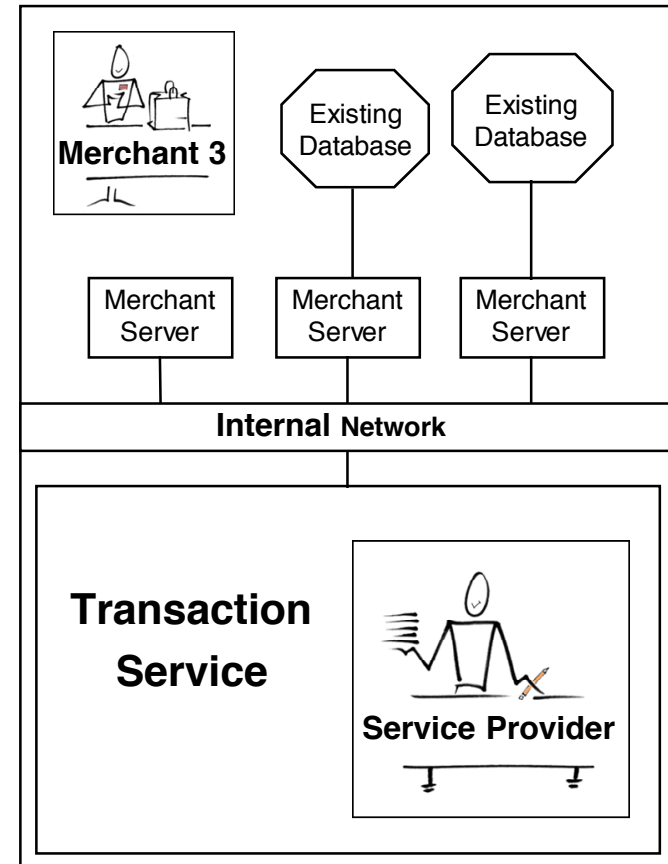
Small Business



Large Business

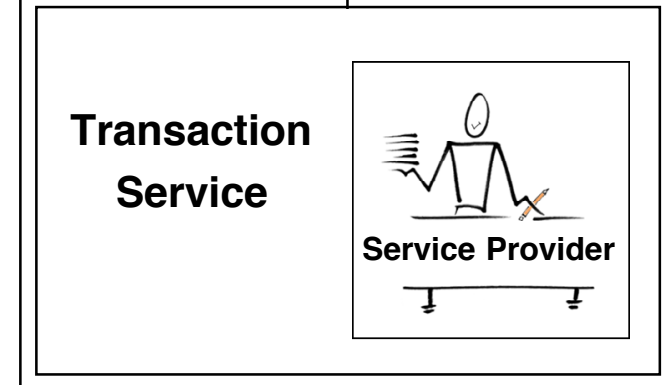
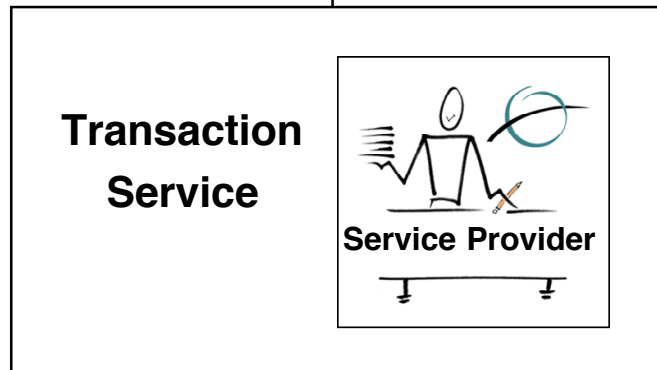


Very Large Business



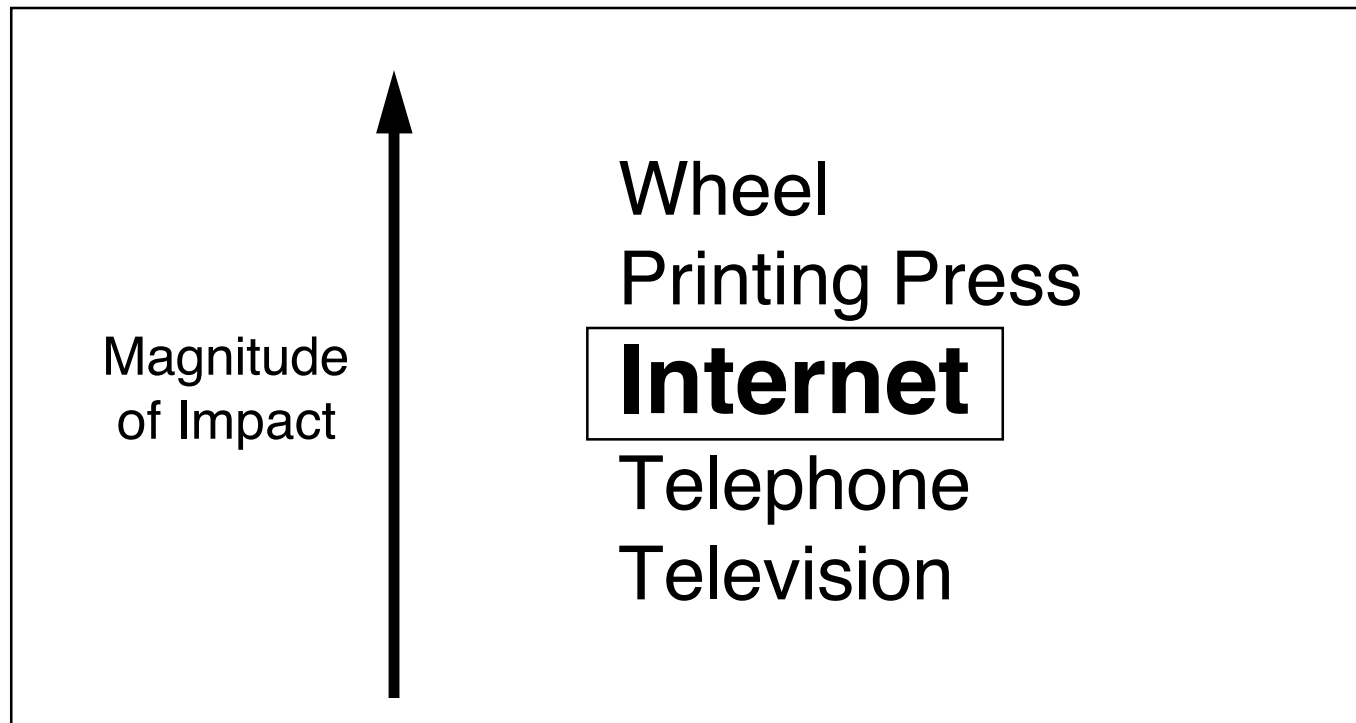
Internet

Internal Network



Closing Thought: What's The Big Deal?

A Historical Perspective From *The Economist* (7/95)



Summary

- Widely deployed, open, standards-based architecture
- Integrates easily with leading solutions (e.g. payment)
- Secure business environment
- Utilize *Front-Office/Back-Office* architecture
- Merchant Solution available November, 1995
- Visit Booth #456 for more information

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